

Guidelines for B.Arch. as per CBCS

Vision of the University

To make India a Knowledge Society and Knowledge Economy by empowering the women of our country through education in Engineering, Science, Management and Technology. To become one of the top technical Universities in the country known for its value based, quality technical education supported with industry relevant research, with focus on environmental and social issues.

Mission of the University

1. To foster an environment for excellence in professional education and ensure active participation of women in the field of Engineering, Science, Management and Technology, while striking out a work-life balance.
2. To start new professional courses for women in sun-rise disciplines and forge alliances with industry to impart industry relevant education.
3. To emancipate women through pursuit of knowledge enabling them to gain equal status in society through realization of their rights and responsibilities
4. To develop sustainable systems and state-of-the-art infrastructure to enable the Indian women to become the future leaders, managers, researchers and productive team players in the field of science, technology and management.

Vision of Department of Architecture and Planning

Development of the individual girl as a responsible member of peaceful, pluralist and inclusive society by learning to explore and practicing quality, sustainable form of architecture.

Mission of Department of Architecture and Planning

The Department of Architecture and Planning in IGDTUW aspires to be the leading voice for excellence in the field of Architecture and Planning in our country, demonstrating how design enhances the quality of life, while addressing important issues of society through responsible architecture. The department aspires to become a distinguished centre of architectural thought, research, learning, innovation, capacity building and scholarly inquiry aiming towards becoming a globally recognised Department and University.

Objectives

1. To provide architectural education to empower students to become protagonist of positive change by exploring, learning and practicing a sustainable and inclusive form of architecture.
2. To develop the capacity of the women students to practice architecture which is humane and sustainable by developing understanding of
 - Sustainability which encompasses not just environmental variables but also socially- economically- culturally responsive architecture.
 - How peace and inclusion can be fostered in society through domains of architecture and planning.
3. To foster innovation and creativity through promotion of holistic learning environment, a flexible and distinctive pedagogy that leverages use of latest technology, hands on

activities in the form of field visits, peer learning, etc. which instils a notion of lifelong learning.

4. To promote a learning environment that welcomes and honours women from diverse cultures for involving themselves in intellectual inquisitiveness, explore knowledge dimensions for future application in industry, profession and life.
5. To shape students into thoughtful and responsible individuals who are effectively able to tackle the challenges of the profession and create ecosystems which enhance the quality of life.

Currently there are following 6 Academic Departments in the University:

Academic Departments

S.No.	Name of Department	Code
1	Applied Sciences and Humanities	ASH
2	Computer Science & Engineering	CSE
3	Electronics & Communication Engineering	ECE
4	Information Technology	IT
5	Mechanical and Automation Engineering	MAE
6	Architecture and Planning	AP

As of now Department of Architecture and Planning offers B.Arch. programme of 05 years duration

Short Title and Commencement:

These Guidelines shall be called the Guidelines, 2019 for the five-year undergraduate Bachelor of Architecture program of the Indira Gandhi Delhi Technical University for Women.

Undergraduate Programs:

- The University may offer such undergraduate programs leading to Bachelor of Architecture i.e. B. Arch. degree(s) as may be approved by the AC and the BoM.
- The structure of a program may be amended/ modified in accordance with the decision of the BoS/AC
- The duration of UG programs leading to degrees of B. Arch. is normally five years. However, the maximum duration for the UG program for the degree of B. Arch. is (n+2) years from the date of initial registration, where “n” is minimum prescribed duration of program. Minimum prescribed duration for B.Arch. programme at IGDTUW is “5” years. The maximum duration of the program includes the period of withdrawal, absence and different kinds of leaves permissible to a student, but it shall exclude the period of rustication. The duration for the UG program may be altered in accordance with the decision of the AC/ BoM.

Board of Studies (BoS):

The Board of Studies (BoS) shall be a sub-committee of the AC, which shall consider all the academic matters related to all the Departments. There will be one BoS for Faculty of Engineering and Technology (FET) which will cover all the Departments from Engineering and Technology disciplines and one for Faculty of Architecture and Planning (FAP). It shall also consider and recommend to the AC the broad framework and policies related to the programs offered by the University.

Semester System:

- The academic programs in the University shall be based on semester system; Odd and Even semesters in a year with winter and summer vacations. A number of courses shall be offered in each semester.
- Each course shall have a certain number of credits assigned to it depending upon the academic load of the course assessed on the basis of weekly contact hours of lecture, studio, practical, tutorial and laboratory classes, assignments or field study or self-study, project work, research work, training, etc.
- The courses offered in a semester shall be continuously assessed and evaluated to judge the performance of a student.

Structure of Undergraduate (BArch) programme

The five year B. Arch. programme comprise of courses divided in five distinct areas, namely:

- Departmental Core Courses (DCC),
- Humanities, Social Sciences, Management and Skill Development Courses (HMC)
- Basic Science and Applied Engineering Courses (BSAE),
- Departmental Elective Course (DEC)
- Generic Open Elective Courses (GEC)

A. Nomenclature

Departmental Core Courses (DCC): These are department specific compulsory courses to be studied by the student as a core requirement for the degree. This includes departmental compulsory courses, Architectural Design, Architectural Drawing, Professional Practice, History of Architecture, Dissertation/Seminar/, etc. courses.

Humanities, Social Sciences, Management and Skill Development Courses (HMC): This category includes courses considered essential for the B.Arch. Program to inculcate the essence of professional ethic, human values and skill development. This includes Humanities and Social Science Courses like Sociology and Psychology, Management Science Courses like Project Management and Professional ability & Skill Development courses like Architectural Internship/ Professional Training , Computer Aided Design, etc .

Basic Science and Applied Engineering Courses (BSAE): This category includes applied sciences like Climatology, Building Construction, Structural design and systems, Building Services, Surveying and levelling, Building Materials and Construction Technology, Mathematics in Architecture, etc. courses to build the foundation for learning of departmental core courses.

Elective Courses

Elective courses are divided into two categories i.e. Department Elective Courses and Generic Open Elective Courses.

(i) Departmental Elective Courses (DEC)

These are very specific or specialized or advanced or supportive courses, to the discipline of architecture or subjects of study, which provide an extended scope or insight. These include subjects like ephemeral architecture, Technology and Architecture, advanced model making, architectural journalism etc.

(ii) Generic Open Elective Courses (GEC):

- GEC enable exposure to some other discipline/ subject/domain or nurtures candidate's proficiency and skills in niche areas which are of interest to the students. GEC courses can be completed in-house (GEC courses offered by IGDTUW) or from any other university in online/offline mode or through MOOC (NPTEL, SWAYAM, edX, Coursera etc) or GIAN Courses

- Variety of courses may include Creative Art Courses like (Dance, Yoga, Music etc), Social Welfare Courses like NCC, NSS, *Unnat Bharat*, *Swachh Bharat*, Fire Fighting etc and Women Empowerment Courses like Women Safety, Self Defence, Gender Sensitization etc) among several others.
- Student may also opt for subjects from Entrepreneurship category where she can enhance/groom her skills to pursue her career as successful entrepreneur. She will be evaluated based on her business plan, innovation involved in the idea, development and execution for the same. Student must be able to prove her sincere efforts in implementing her business idea and bringing it to the next level.
- If a student is interested in pursuing research career, she may opt for writing research paper (in refereed journal of national/international repute preferably) and based on the quality of research paper published, she may be suitably awarded the marks/grade. The necessary consent / approvals from the department, as and when required may be obtained by the student
- Students, who are more inclined towards project development, may work on a live and sufficiently large project under the guidance of a faculty member or industry person. These students may be evaluated based the performance in the project development.
- If the student opts for a GEC course outside IGDTUW in offline/online mode, all the expenses including registration and certification fee shall be borne by the student. The duration of GEC course shall be minimum 8 weeks (Tentatively as per University Norms).
- For MOOC / GIAN / other courses department may prepare separate guidelines for conduct of the course and students must seek timely prior approval from department for registering course outside university (online/offline) and for any online / MOOC / GIAN / course

B. Total Number of Credits in B.Arch.: 260

Summary- Credit Score	
B.Arch.	
Semester	Credit Allocated
First Semester	28
Second Semester	29
Third Semester	26
Fourth Semester	28
Fifth Semester	29
Sixth Semester	28
Seventh Semester	28
Eight Semester	20
Ninth Semester	24
Tenth Semester	22
TOTAL	260

C. Credits of Different Curricular Components

Curricular Components	Credits	Weightage (Approx.)
Departmental Core Courses (DCC)	136	52%

Humanities, Social Sciences, Management and Skill/Entrepreneurship Development Courses (HMC)	27	10%
Basic Science and Applied Engineering Courses (BSAE)	72	28%
Departmental Elective Courses (DEC)	15	6%
Generic Open Elective Courses (GEC)	10	4%
Grand Total	260	100%

Program Advisor:

A Program Advisor shall be appointed by the Head of the Department for each program who will advise the students for registration.

Course Coordinator:

Every course/subject offered by a Department shall be coordinated by a Course Coordinator appointed by the Head of the Department. The Course Coordinator shall have full responsibility for the course. He/she shall coordinate the work of other faculty members involved in that course in respect of their participation in various activities related to the course including continuous evaluation of the students through tests, quizzes, assignments, mid-term and end-term examination and the award of the grades.

Course Coding

A course is identified by a course code designated by a string of alpha-numeric characters and a course title. In a course code, first letter indicates the level (UG/PG), next two letters of the string indicate the Academic Department code (like AP for Architecture and Planning, IT for Information Technology etc.) offering the course and the last three numbers designate particular course number.

Course Number

For all the courses, the first digit corresponds to the level (year) at which a course is normally offered. The last two digits denote the number of the course, which will usually be odd for courses offered in the Odd Semester and even for courses in the Even Semester. For example, the course, "Building Materials and Construction Technologies", offered to B Arch students in second year 'Odd Semester' is numbered as BAP-203.

Course Credits:

Each course shall have an integer number of credits, which reflects its weight. The number of credits of a course in a semester shall ordinarily be calculated as under:

Lectures/Tutorial: One lecture hour per week shall normally be assigned one credit. One hour of tutorial per week shall be assigned one credit. However, in case required, the credits may be adjusted further by taking into consideration the quantum of work required to be put in by a student for learning the course having two/three hours of contact every alternate week may have one credit only.

Practical's: One practical / laboratory hour per week shall normally be assigned half a credit. However, in case required, the credits may be adjusted further by taking into consideration the quantum of work required to be put in by a student for learning the course having two/three hours of contact every alternate week may have one credit only.

Studio: One studio hour per week shall normally be assigned one credit. However, in case required, the credits may be adjusted further by taking into consideration the quantum of work

required to be put in by a student for learning the course having two/three hours of contact every alternate week shall have one credit only.

Conduction of Examination:

As per IGDTUW Regulations/Guidelines

Teaching Engagements

Every course maintains a teaching schedule for which weekly contact hours are decided for delivering lectures (L), engaging studios (S) and/or conducting practical classes (P) to make learning in a course more hands on, experiential and effective. In the syllabi, the information regarding number of course credits and contact hours per week is denoted as: Credits (L – S – P); 2 (2-0-0) or 4(0-4-0) or 2(0-0-4) etc.

1 hour of Theory/Studio session = 1 credit

2 hour of practical session = 1 credit

Weights for Course Evaluation

Evaluation in every course is based on the weights assigned to various components of the course curriculum. These components are designated as under:

CAT	Cont. Assessment – Theory
CAP	Cont. Assessment - Practical
CAS	Cont. Assessment - Studio
MTET	Mid Term Examination-Theory
MTEP	Mid Term Examination-Practical
ETEP	End Term External Examination-Practical
ETES	End Term External Examination-Studio
ETET	End Term Examination-Theory
ETIP	End Term Internal - Practical

In general, the relative weights assigned to different components of the entire course are as given below:

Theory Subjects:

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

Practical Subjects:

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
0	2+	0	--	--	--	35	--	15	--	--	50

2+ means Practical of 2 hours or more

Studio Subjects:

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	4+	--	--	--	50	--	--	--	--	50

4+ means Studio of 4 hours or more

ETEP/ETES is for Project/assignment based evaluation only (Internal Evaluation: 50, End Term Examination: 50). End Term Examination will be based on Presentation/portfolio and Viva Voce based and will be conducted by External Examiner/Faculty from other Departments/ Institutes. There shall be only one Mid Term Examination during a semester for any course (as applicable). If a student fails to appear in Mid Term Examination of any course (s) due to any genuine reason, HoD may take appropriate action at departmental level.

For examinations of common courses with other departments, the End Term Examinations/Mid Term Examinations/Continuous Evaluation, etc may be aligned with other departments.

Credit System

The University follows a modern method of continuous evaluation, which is prevalent in most of the professional institutions nationally and internationally, through a credit system in all its programs. The system offers flexibility to progress at a pace commensurate with the capabilities of a student to minimum credit requirements. The award system follows letter grades on a 10-point scale, where the performance is measured in terms of weighted grade point averages (SGPA and CGPA). A student has to satisfy minimum CGPA and earned credit requirements to be eligible for the award of degree.

To pass a subject or to earn the credits for a subject, student has to score minimum 45 marks in that subject. To be eligible for getting B.Arch. degree, a student has to earn 260 credits out of total 260 credits with minimum 5.0 CGPA. It is compulsory to clear all Departmental Core Courses, Basic Sciences and Applied Engineering Courses and Architectural Internship/ Professional Training to be eligible for getting the degree.

Grading System:

- The academic performance of a student shall be graded on a 10-point scale.
- To pass a course or to earn the credits for a course, student has to score minimum 45 marks in that subject.
- The letter grades awarded to a student in all the courses shall be converted into a semester and cumulative performance index called the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA), to be calculated.
- At the end of the program, a student with CGPA “greater than or equal to 8.5 or above” shall be awarded ‘First Division with Distinction’. Students in the range of CGPA “greater than or equal to 6 but less than 8.5” shall be awarded “First Division”. Students in the range of CGPA “Greater than or equal to 5.0 but less than 6” shall be awarded as “Second Division”.
- A student, who has earned the minimum credits required for a degree but fails to obtain the minimum specified CGPA for this purpose, shall be allowed to register in course(s) till the minimum CGPA is attained within the maximum time limit for different programs.

Grading System

Academic Performance	Grades	Grade Points
Outstanding	A ⁺	10
Excellent	A	9

Very Good	B ⁺	8
Good	B	7
Average	C ⁺	6
Below Average	C	5
Marginal	D	4
Poor	F	0

Calculation of Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA)

$$SGPA = \frac{\sum_{i=1}^n c_i \times p_i}{\sum_{i=1}^n c_i}$$

Where, c_i = Number of Credits of the i th course of a semester for which SGPA is to be calculated,
 p_i = Grade point obtained in the i th course and $i = 1 \dots n$, represent the number of course in which a student is registered in the concerned semester

$$CGPA = \frac{\sum_{i=1}^m c_i \times p_i}{\sum_{i=1}^m c_i}$$

Where, c_i = Number of Credits of the i th course of a semester, p_i = Grade point obtained in the i th course. A grade lower than 'D' (i.e. grade point < 4) in a course shall not be taken into account and $i = 1 \dots m$, represent the number of courses in which a student was registered and obtained a grade not lower than 'D' upto that semester for which CGPA is to be calculated.

General guidelines for the Award of the Grades

- All evaluations of different components of a course shall be done in marks for each student.
- The marks of various components shall be reduced to approve weights as indicated in the scheme of Teaching and Examination and added to get total marks secured on a 100-Point scale. The rounding off shall be done only once and on the higher side.
- It is suggested that there will not be more than 10% to 20 % (rounded off to near integer value) A+ grade. Grade moderation committee may decide to alter this range if required/appropriate
- The grades so awarded shall be moderated by Moderation Committee of a Department.
- For a student to get passing grade, she will have to appear in End Term Examination.
- The method suggested (given below) shall be used for the award of grades with or without marginal adjustment for natural cut- offs.

Statistical Method for the Award of Grades (Relative Grading)

For the award of grades in a course, all component-wise evaluation shall be done in marks. The marks of different components viz. Mid Term Examination Theory (MTET and MTEP), End Term Examination Theory (ETET), End Term External Examination Practical (ETEP), End Term External Examination Studio (ETES), Continuous Assessment-Theory (CAT) and Continuous Assessment-Practical (CAP), Continuous Assessment-Studio (CAS) would be reduced to relative weights of each component and added. Marks so obtained shall be out of 100 and the same would be converted to grades following the guidelines given below:

The statistical method shall invariably be used, with marginal adjustment for natural cut-off. The mean and the standard deviation of marks obtained of all the students in a course shall be

calculated and used to convert the marks into normal variate (Z). The normalized marks (Z) shall be arranged in decreasing order to work out ranges for different letter grades.

Where X = Actual Marks obtained, \bar{X} = Mean of marks and σ = Standard deviation.

$$Z = \frac{X - \bar{X}}{\sigma}$$

The grade boundaries are left to the discretion of Moderation Committee. However, a minimum of 'D' grade will be awarded if the student scores equal to more than 45 marks in aggregate in a course. The set of boundaries for Z variate is mentioned in the Table below:

Lower Range of Z	Grade	Upper Range of Z
>1.5	A ⁺	--
>1.0	A	≤ 1.5
>0.5	B ⁺	≤ 1.0
>0.0	B	≤ 0.5
>-0.5	C ⁺	≤ 0.0
>-1.0	C	≤ -0.5
>-1.5	D	≤ -1.0
--	F	≤ -1.5

Awards of Grades Based on Absolute Marks System (if the number of students are less than or equal to 30) to be made as given in the below table

Marks	Grade	Marks
≥93	A ⁺	≤100
≥85	A	≤92
≥77	B ⁺	≤84
≥69	B	≤76
≥61	C ⁺	≤ 68
≥53	C	≤ 60
≥45	D	≤52
-	F	<45

Course Registrations:

- Every student shall be required to register for the courses that she wants to study for earning credits and her name will appear in the roll list of each of these courses. No credit shall be given if a student attended a course of which she has not registered. The performance of a student in all the courses, for which she has registered, shall be included in her grade card(s).
- Student should first register for the courses of the current semester and then register for the subjects, in which she has been declared failed in the previous years/semesters.**
- Those students who are joining the first year of the UG program shall complete the registration procedure on a specified registration date as per academic calendar/schedule notified from time to time.

Minimum Number of Students Required for an Elective Course:

An elective course in the Department may run only if a minimum of 30% of students register for it in a semester. Generic Open Elective (GEC) Course may run only for a minimum number of 40 students. However, for a MOOC / GIAN/ offline (off-campus) courses, there will not be any restriction on the number of students.

Course Evaluation:

- A student shall be evaluated for her academic performance in a course through tutorials, practical's, assignments, term papers, examination, field work/ industrial training, seminars, quizzes, reports, juries, viva-voce, presentations, portfolio, etc. as Continuous Assessment-Theory (CAT) and Continuous Assessment-Practical (CAP), Continuous Assessment - Studio (CAS), Mid-Term Examination Theory (MTET), Mid-Term Examination Practical (MTEP), End-Term Examination- Theory (ETET) and End Term External Examination-Practical (ETEP), End Term External Examination-Studio (ETES) as applicable according to the guidelines formulated by the AC.
- Answer sheets of the test(s) and examination(s) cannot be written in pencil.
- Evaluation of Answer sheet(s) should not be in pencil.
- A student can go through her answer sheet(s) of MTET and the ETET and point out any discrepancy in its evaluation on a day fixed by the Department. Objections will be entertained right then, and not even on the next day. Head of Departments will ensure that end term examination answer sheets are shown to the students before the day of moderation, on a date to be specified and prominently displayed by the respective teachers. The answer sheets of the End-Term Examination shall not be shown to a student after finalization of the grades by the Grade Moderation Committee.
- The Architectural Internship/ Professional Training /industrial/field training shall normally be evaluated through the quality of work carried out, the report submission , presentation(s) / portfolio and viva voce examination

Grade Moderation Committee:

- The Dean (Examination Affairs) / Controller of Examination (CoE) will constitute the Grade Moderation Committee for all the Academic Courses under its purview. The Head of the Department shall be the Chairperson of the committee, and other members shall consist of 1 Professors of the department, 2 Associate Professors of the department and 2 Assistant Professors of the department. This committee shall be responsible for adherence to the guidelines for the award of grades.
- The Grade Moderation Committee for the common courses offered shall consist of all the Course Coordinators of the courses offered to students in a semester with the Dean (Academic Affairs) as the Chairperson. The Chairperson, Grade Moderation Committee shall be responsible for the display of grades and for forwarding the final grades to the Dean(Examination Affairs)/Controller of Examinations. The Chairperson, Grade Moderation Committee shall also retain the record copy of marks and grades along with the statistical parameters for all the courses moderated by the committee.
- The Dean (Examination Affairs)/Controller of Examinations shall organize the tabulation of grades and declaration of results. Dean (Examination Affairs)/COE shall be the custodian of records related to examination and results.

Supplementary Examinations:

- Supplementary Examination in any course (s) (for all semesters) shall be permissible along with regular exams in continuation, in every semester.
- A student will carry the marks obtained by her in the Mid-Term Examination, Practical Examination and Continuous Assessment.
- Students will be awarded marks as per the performance in Supplementary exam. Accordingly, grades will be awarded on the basis of performance of the student in Supplementary exam as per Absolute marks system.
- Supplementary Examination will be allowed only if a student has not been disqualified earlier, either due to shortage of attendance or use of unfair means.

The maximum duration of the B. Arch. program is n+2 years, where “n” is minimum prescribed duration of program. Minimum prescribed duration for B.Arch. programme at IGDTUW is “5” years. A student whose enrolment has been terminated may appeal to the Vice Chancellor for reconsideration within fifteen days from the date of issuance of the communication of termination and if the appeal is allowed, her registration and enrolment shall be restored.

Scrutiny of Grades, Tabulation and Declaration of Results

- A student may apply for scrutiny of grades to the Dean (Examination Affairs) within three days from the scheduled date of display of grades. A committee consisting of the Dean (Academic Affairs) and the concerned Chairperson of the Grade Moderation Committee may check the entry of the weights from different components of evaluation and their addition. The results of scrutiny may lead to either a change in grade due to mistake(s) in any of the aspects scrutinized by the committee or the grade may remain unchanged. The results will be intimated to the Dean (Examination Affairs) within three days from the date of receiving the application. For the common courses, the Chairperson of the Grade Moderation Committee and the Course Coordinator shall constitute the Scrutiny Committee.
- In exceptional circumstances the grade(s) of a student or a number of students may be scrutinized by a committee constituted by the Vice Chancellor.
- The Dean (Examination Affairs)/Controller of Examinations shall organize the tabulation of grades and declaration of results. Dean (Examination Affairs)/COE shall be the custodian of records related to examination and results.

Unfair Means

As per IGDTUW Regulations/ Guidelines

Attendance, Absence, Leave and Withdrawals:

- All the students are expected to attend every lecture, studio, tutorial, practical, drawing, any other classes/special lectures/seminars/workshops/trainings.etc. scheduled for them.
- The students must have a minimum attendance of 75% of the total number of classes including lectures, studio, tutorials and practical's, etc.held in a subject in order to be eligible to appear at the End-Term Examination for that subject.
- The Dean (Academic Affairs), authorized by the Vice Chancellor for this purpose may relax the minimum attendance upto 10% for reasons to be recorded. This relaxation may be granted on production of documents showing that the student was either busy in the authorized

activities or suffering from any disease. The student should submit these documents to the Course Coordinator/HoD within seven days of resuming the studies.

- Under exceptional circumstances, the Vice Chancellor may further relax the minimum attendance up to 5%.
- Attendance of the students shall be monitored and displayed during a semester as per the guidelines approved by the AC/BoM.
- The names of the students whose attendance is less than 75% {subject to the relaxation mentioned above } in the classes held in a course will be intimated by the Course Coordinator on the last teaching day, to the HoD, who will consolidate the list for all such students for all the courses of a given yearly level of a program and display it on the notice board of the Department. The list of such students shall also be forwarded to the Dean (EA)/CoE. These students shall not be allowed to appear in the End-Term Examination of that course and shall be awarded the grade 'F' irrespective of their performance in Class Work Sessional (CWS)/ Mid Term Examination (MTE)/ Continuous Assessment etc.

Academic Registration:

- Every student shall be required to register in each semester on the scheduled date as per academic calendar of the University till the completion of the degree. If the student does not register on scheduled date she has to pay late registration fee notified from time to time. Registration in absentia may be permitted by the Dean (Academic Affairs). In absentia registration may be allowed only in rare cases such as illness or any other contingencies, at the discretion of the Dean (Academic Affairs).

Time Table:

- The time table will be displayed on the student's notice board/ IGDTUW website for the information of students. This task may be completed at least one week before the commencement of semester.

Withdrawal from Course:

A student who wants to withdraw from a course shall apply through the HoD to the Dean (Academic Affairs), on a prescribed form within one week from the end of the Mid-Term Examination under the advice of her Program Advisor and HoD. If her request for withdrawal is granted, it will be recorded in the registration record of the student and the concerned Course Coordinator will be informed about it.

Semester Withdrawal:

In case a student is unable to attend classes for more than four weeks in a semester she may apply to the Dean (Academic Affairs) through HoD, for withdrawal from the semester, which shall mean withdrawal from all the registered courses in the semester. However, such application shall be made to the Dean (Academic Affairs), through HoD and Program Advisor, as early as possible and latest before the start of the End-Term Examination. Partial withdrawal from the semester shall not be allowed.

Semester Withdrawal on Medical Grounds:

In case the period of absence on medical grounds is more than twenty working days during the semester, a student may apply for withdrawal from the semester, if she so desires. But as per provisions of "withdrawal from course" and "semester withdrawal", application must **be**

made to the Dean (Academic Affairs), through HoD and Program Advisor, as early as possible and latest before the beginning of End-Term Examination.

Any application on medical grounds shall be accompanied with a medical certificate from University doctor/Medical Officer. A certificate from a registered medical practitioner containing the registration number may also be accepted in those cases where a student is normally residing off-campus or becomes ill while away from the University.

Rustication/Suspension/ Withdrawal from a Semester/year:

A student rusticated from the University or suspended or debarred from the classes due to any reason whatsoever or having withdrawn from a semester/year on medical grounds, shall have to meet the requirement of 75% attendance in each course in a semester and shall have to complete the program within its maximum time limit of seven years for five year UG (B.Arch.) program as specified in Guidelines excluding the period of expulsion, if any.

Termination of Enrolment:

- **Due to Absence:**

If a student registered in the first year of the program is continuously absent from the classes for more than four weeks in continuation without informing the HoD/ Course Coordinators / Programme Advisor and without valid medical reason or any other special circumstances, the Coordinator/Programme Advisor shall bring it to the notice of HoD, of the concerned department for informing the Dean (Academic Affairs). The names of such students may be removed from the university rolls.

A student whose enrolment has been terminated may appeal to the Vice Chancellor for reconsideration within fifteen days from the date of issuance of the communication of termination and If the appeal is allowed, her registration and enrolment shall be restored.

Earned Minimum Credits and Minimum CGPA for the Degree:

- The credits for the courses in which a student has obtained 'D' (minimum passing grade for a course) grade or higher shall be counted as Credit Earned by her. A student who has a minimum CGPA of 5.0 and earned the required number of credits as specified in the UG curriculum she is registered for, is eligible for the award of the respective degree.
- A student, who has earned the minimum credits required for a degree but fails to obtain the minimum specified CGPA for this purpose, shall be allowed to register in course(s) till the minimum CGPA is attained within the maximum time limit for different programs.

Phasing out of a Program:

The phasing out of any program may be considered by the AC on the recommendation of the BoS. Also, a program may be phased out by the AC if, consecutively for three years, the number of students registering for the program is less than 40% of the sanctioned intake of the students.

Starting a New Program:

- The BoM may approve the starting of a new program or a modified program in lieu of the old phased-out program on the recommendation of the BoS and the AC.
- A new program may be considered and recommended by the AC to the BoM for its consideration and approval. Such a proposal will be initiated by a Department through its BoS.

Interpretations of Regulations:

In case of any dispute, difference of opinion in interpretation of these Regulations or any other matter not covered in these Regulations, the decision of the Vice Chancellor shall be final and binding.

Emergent Cases:

Notwithstanding anything contained in the above Regulations, the Vice Chancellor may, in emergent situation, take such action including insertion, suspension or modification of any Regulation(s) on behalf of the AC as he/she deems appropriate and report it to the next meeting of the AC for its approval.

B.ARCH SEMESTER I

Detailed Course Curriculum/Scheme of Examination-Semester 1
Bachelors of Architecture,IGDTUW

FIRST YEAR					
First Semester					
S.No.	Code	Subject	(L-S-P)	Credit	Category
1	BAP 101	Introduction to Architectural Design - I	0-8-0	8	DCC
2	BAP 103	Building Materials & Construction Technology – I	0-5-0	5	BSAE
3	BAP 105	Architectural Drawing - I	0-4-0	4	DCC
4	BAP 107	Architectural Graphics - I	0-0-4	2	DCC
5	BAP 109	History of Architecture- I	2-0-0	2	DCC
6	BAP 111	Structures - I	2-0-0	2	BSAE
7	BAP 113	Climatology and Environmental Studies I	2-0-0	2	BSAE
8	BAP 115	Architectural Workshop - I	0-0-2	1	DCC
9	BAP 117	Mathematics in Architecture	2-0-0	2	BSAE
			Total	28	

- Departmental Core Courses (DCC)
- Humanities, Social Sciences, Management and Skill/Entrepreneurship Development Courses (HMC)
- Basic and Applied Science Courses (BSAE)
- Departmental Elective Courses (DEC)
- Generic Open Elective Courses (GEC)

INTRODUCTION TO ARCHITECTURAL DESIGN-I			
Course Code	BAP 101	Credits	08
Contact Hours (Hrs/Week)	08	Semester	01
Course Category	DCC		

INTRODUCTION

This subject introduces students to the idea of space making with emphasis on process, abstraction, and modes of representation.

COURSE OBJECTIVES

- To develop understanding of interconnections between form, volume and function.
- To sensitize students towards the interconnectedness of various elements of a context which impact the architectural design.

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Anthropometrics pertaining to various areas of space design.
- Determine space requirements for various day to day activities.
- Establish relations between form, space and function with the help of simple flow path, circulation diagrams etc.

PEDAGOGY

- Case studies along with primary and secondary surveys.
- Documentation of various data collected from case studies, research and literature studies.
- Models and sketches.
- Synergy of various layers of data and its application in a small-scale space design.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	8	--	--	--	50	--	--	-	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Anthropometrics <ul style="list-style-type: none"> • Study of anthropometrics and their relationship with the dimensions of objects of daily use. • Determining space for activities such as living, dining, sleeping and conveniences. • Measured drawing of a small building such as, a small room/studio,etc. of a house ,office etc. 	16
2.	Study of Circulation Simple circulation/flow diagrams for small building projects	16
3.	Spatial Organization Three-dimensional organization of a variety of forms to create built forms, importance of shades and shadows in the entire composition, layout of repetitive units within a site to create interesting and functional compositions	16
4.	Design exercises <ul style="list-style-type: none"> • Evolution of plan in relation to physical, site considerations, selection of 	64

	<p>materials and construction, study of architectural design vis a vis the concepts of privacy, security, comfort and maintenance</p> <ul style="list-style-type: none"> • Single room design, such as self-occupied room, tea stall, guard room, canopy, boundary wall etc. • Design of small residential components, such as a kitchen, bathroom, bedroom etc. 	
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REFERENCE BOOKS

1. Ching, F.D.K and Juroszek, S.P (1998). *Design Drawing*. New York: Van Nostrand Reinhold
2. Neufert, P. (2000). *Architects Data*. 3rd Ed. UK: Blackwell Wiley
3. Agkathidis, A., Hudert, M. and Schillig, G. (2007). *Form Defining Strategies: Experimental Architectural Design*. New York: Wasmuth.
4. Watson, D. (Editor). (2005) *Time-saver Standards for Architectural Design: Technical Data for Professional Practice, 8th Ed.*, McGraw-Hill.
5. Ching, F. D. K. (2012). *Architecture: Form, Space and Order*. 3rd Ed. Hoboken: John Wiley & Sons.

Course Code	BAP 103	Credits	05
Contact Hours (Hrs/Week)	05	Semester	01
Course Category	BSAE		

INTRODUCTION

This course is designed to expose students to the process of building construction, the components of buildings and the materials, skills and equipment used in shaping them.

COURSE OBJECTIVES

- To familiarize students with basic building materials and their properties.
- To make students understand how materials can have architectural application.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Properties and behaviour of some readily available building materials.
- Designing and construction with the building materials.
- Application of available construction technology.

PEDAGOGY

Classroom teaching is supported with preparation of drawings and site visits.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	5	--	--	--	50	--	--	-	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Introduction to basic building materials <ul style="list-style-type: none"> • Mud: Study of soil map of India, Type of soils, making mud bricks, cob, adobe, Stabilization and use for walling and terracing. • Bricks: Kinds, types, constituents and properties of brick earth, manufacturing of various types of bricks, decorative brickwork and jail work • Stone: Study of stone map of India, Kinds, properties, varieties and their characteristics, stone masonry. • Sand: Sources, classification and properties • Lime and Cement: Sources, classification, properties and method of manufacturing, testing, mixing and uses 	15
2.	Foundations: <ul style="list-style-type: none"> • Definition, safe bearing capacity of soils and methods of improving the depths and width of foundations, causes of failure and remedies, simple, steeped, combined and cantilevered footing, RCC footing and raft foundation. Foundation details up to plinth level. 	25
3.	Walls: <ul style="list-style-type: none"> • Masonry walls in bricks and stone, in various thicknesses. Brick bonds English, Flemish, Rat-trap etc. Tee and cross-junctions, corbelling. Different type of 	15

	stone masonry . Brick jali walls.	
4.	Damp proofing: Different types of damp proof materials, their compositions and application, Constructional details of walls, floors, foundations etc. with particular emphasis of their damp proofing and natural ventilation.	15

REFERENCE BOOKS

1. Kumar, S.K. (2001). "Building Construction", 19th Ed., Standard Publishers Distributors.
2. Allen, E. and Iano, J. (2004). "Fundamentals of Building Construction: Materials and Methods", Wiley.
3. Mehta, M., Scarborough, W. and Armpriest, Diane, "Building Construction: Principles, Materials and Systems", Pearson Prentice Hall.
4. Barry, R. (1999). The Construction of Buildings Vol. 2. 5th Ed. New Delhi : East-West Press.
5. Foster, J. and Mitchell, S. (1963). Building Construction: Elementary and Advanced, 17th Ed. London : B.T. Batsford Ltd.
6. Hailey and Hancork, D. W. (1979). Brick Work and Associated Studies Vol. II. London : MacMillan.
7. McKay, W. B. (2005). Building Construction Metric Vol. I-IV. 4th Ed. Mumbai : Orient Longman.

ARCHITECTURAL DRAWING - I			
Course Code	BAP 105	Credits	04
Contact Hours (Hrs/Week)	04	Semester	01
Course Category	DCC		

INTRODUCTION

Drawing is the language used by architects to communicate with rest of the world about their work. It is important for architects to be able to draw what has been visualized by them, in a manner which can be easily understood by clients/ other people. This course enables students to draw, what has been visualized them, in a technically correct manner.

COURSE OBJECTIVES

The objectives of the course are to:

- Introduce and familiarize students with drafting tools and accessories.
- Give basic knowledge of good drafting and lettering techniques.
- Develop the understanding of scales in architectural drawings
- Develop comprehension and Visualization of geometric forms.
- Develop the understanding of representing three-dimensional objects on two-dimensional sheet.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Represent various building elements in drawings appropriately
- Use various technical drawing instruments.
- Draw basic technical drawings.
- Visualize and draw simple solids in 3D.

PEDAGOGY

Classroom/ studio teaching shall be supported by study of drawing work / graphical representation through books / archival material/ reports/drawings/etc.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES [#]
0	0	4	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Introduction <ul style="list-style-type: none"> • Drawing Instruments and their uses. • Sheet layout and sketching. • Lettering and dimensioning, • Reduction and enlargement of drawings on different scales, representation of materials and architectural elements through architectural graphic symbols • Pencil drawings, tonal value, variation flight, shading and texture techniques • Conventions in Architectural Drawings • Fundamentals of Measured Drawing 	20

2.	Scales and proportion <ul style="list-style-type: none"> Scales: Engineers scale, Graphical scale and Representation factor (R.F.) Scales on drawings. Types of scales: Plain scale and Diagonal scale 	10
3.	Basic projections, <ul style="list-style-type: none"> Definition, Meaning & concept. Principles and Methods of projection. Orthographic projections Orthographic projection (Third angle projection) Planes of projection. Projection of points, lines & planes and solids. 	10
4.	Axonometric, isometrics projections <ul style="list-style-type: none"> Projection and three-dimensional views of solids and composition of solids 	16

REFERENCE BOOKS

- Ching, F. D. K. (2012). Architecture: Form, Space and Order, 3rd Ed. Hoboken : John Wiley & Sons.
- Rudolf, A. (1977). The dynamics of architectural form. Berkeley and Los Angeles: University of California Press.
- Criss. B. M. (2011). Designing with models: A Studio guide to Architectural Process Models. 3rd Ed. Hoboken :John Wiley & Sons.
- Morris, I. H. (1902). Geometrical Drawing for Art Students. Longmans
- Lockard, W. K. (1992). Drawing as a Means to Architecture. 6th Ed. New York : Van Nostrand Reinhold Company.
- Zell, Mo. (2008). The Architectural Drawing Course. 1st Ed. Thames and Hudson.
- Bhatt, N.D. and Panchal, V.M., "Engineering Drawing – Plane and Solid Geometry", 48th Ed., Charotar Publishing House. 1996.

ARCHITECTURAL GRAPHICS -I			
Course Code	BAP 107	Credits	02
Contact Hours (Hrs/Week)	04	Semester	01
Course Category	DCC		

INTRODUCTION

Introducing students to fundamental techniques of Visual representation and to equip with the basic principles of representation.

COURSE OBJECTIVES

- To develop presentation skills, visual expression and representation and imaginative thinking.
- To familiarize the students with the various mediums and techniques of art through which artistic creativity through a hand on working with various mediums and materials.
- To familiarize students with the grammar of art by involving them in a series of free hand representations of and to develop comprehension of scale
- To understand still life drawing - from Observation.

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Building up the vocabulary in visual and basic design principles using various representation techniques.
- To present in graphic form all elements of building design and others - study of shades and shadows, textures, tones, colour ,geometrical form, perspectives and projections, free hand drawing and rendering in different media.

PEDAGOGY

Along with progressive evaluation of class assignments, exercises both indoor and outdoor to understand form, proportion, scale, etc. to involve students in a series of exercises which will look at graphic and abstract. Involving them in a series of exercises which will help them experiment with form and volume and various hands on activity/presentations along with end semester portfolio evaluation.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
0	4	0	--	--	--	35	--	15	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Principles and elements of design <ul style="list-style-type: none"> • Two-dimensional design elements, such as, point, line, direction, shape, size, colour and texture; • Three-dimensional design profiles of geometric forms and their arrangements in different compositions. • Harmony and contrast in 2-D and 3-D design; interplay of light and shade on building blocks and their effect. • Style, rhythm, balance, unity and order, Scale and proportion in 	20

	architecture; Le Modular and other concepts.	
2.	Colour theory <ul style="list-style-type: none"> Psychology of colour, colour mixtures, colour systems, colour organization, application of colour schemes, national and international standards on colour. 	10
3.	Study of elementary two-dimensional shapes <ul style="list-style-type: none"> Compositional exercises in 2D compositions in various materials and media. 	10
4.	Study of elementary three-dimensional volumes <ul style="list-style-type: none"> Study of elementary three-dimensional form. Compositional exercises in 2D and 3D compositions and models in various materials and media. Ordering combination principles and their application in building through exercises in design of murals, screens and voids in walls 	16

REFERENCE BOOKS

1. Bhatt, N.D. and Panchal, V.M., "Engineering Drawing – Plane and Solid Geometry", 48th Ed., Charotar Publishing House. 1996.
2. Griffin, A.W. and Brunicardi, V.A., "Introduction to Architectural Presentation Graphics", Prentice Hall. 1998.
3. Ciriello, M., "Architectural Design Graphics", McGraw-Hill. 2002.
4. Ching, F.D.K., "Architectural Graphics", 4th Ed., John Wiley. 2003
5. Carpo, M., "Perspective, Projections and Design: Technologies of Architectural Representation", Routledge. 2008.
5. Parmar, V.S., "Design Fundamentals in Architecture", Somaiya Publications, 1973.

HISTORY OF ARCHITECTURE-I			
Course Code	BAP 109	Credits	02
Contact Hours (Hrs/Week)	02	Semester	01
Course Category	DCC		

INTRODUCTION

Architecture is one of the products of civilization. It is a combined outcome of various factors such as geology, geography, climate, beliefs, religion, society, politics, economy, culture and way of life. This syllabus revolves around the domain of civilization covering prehistoric age and early civilizations.

COURSE OBJECTIVES

- To study the development of civilizations and its architectural implications.
- To study the architecture of the ancient world on a conceptual basis rather than specific and complex questions about the architecture.

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Development of civilizations.
- Evolution of architecture through times.
- Understand the impact of various factors such as geology, geography, climate, beliefs, religion, society, politics, economy, culture and way of life on architecture.

PEDAGOGY

Classroom teaching through multi-media.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP#
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	Unit 1 Prehistory and Introduction to Three Age System <ul style="list-style-type: none"> • Stone Age (Paleolithic and Neolithic Systems); Cave Dwellings in Europe: Lascaux, Chapelle Aux-Saints; First attempts at Marking Nature: Terra Amata, Skara Brae, the megaliths, obelisks. Compositions such as Stone Henge; • Beginnings of Agriculture and Settled Life, First Settlements like Jericho, CatalHuyuk. 	07
2.	Unit 2 River Valley Civilizations in Egypt and Mesopotamia <ul style="list-style-type: none"> • Growth of Settlements, Religious and Social Architecture. • Egypt: Social systems, religious beliefs, science and writing; Evolution of Tomb Architecture: Mastabas, Pyramids at Saqqara, Meidum and Giza; 	07

	<p>Mortuary Temples: Hatshepsut; Cult Temples: at Luxor and Karnak.</p> <ul style="list-style-type: none"> Mesopotamia: the Sumerians, Babylonians, Assyrians and the Persians; their Art, Intellectual Achievements and Developments in Law; the Ziggurats at Ur, Choga Zanbil, etc.; the cities of Ur, Babylon, Khorsabad and Persepolis. 	
3.	<p>Unit 3 Bronze Age Indus Valley Civilization in India and China</p> <ul style="list-style-type: none"> Town Planning, Trade and Commerce; Mohenjodaro and Harappa. Early Iron Age Civilization in India: the coming of the Aryans and Vedic Age; Epic Age; development of Hinduism Religious and Caste systems, Wooden Origins of Indian Architecture: Forest Dwellings, Kutiya and Grama. River Valley Civilization in China: Dynasties such as the Shang, Chou, Ch'in, Ming, etc.; Political History, philosophy, and scientific achievements; palaces like the Imperial Palace, Forbidden City; Altars and Temples; Imperial Tombs. 	07
4.	<p>Unit 4 Beginning of Buddhist and Jain Architecture in India</p> <ul style="list-style-type: none"> Philosophy and teachings; the Hinayana and Mahayana Sects and their contribution to the development of architecture in India. Ashokan School, Buddhist Rock Cut Architecture: The Chaityas and Viharas at Ajanta and Ellora; the Stupa: Form and Evolution; Buddhist Architecture in Gandhara. 	07

REFERENCE BOOKS

1. Tadgell Christopher (1990). *A History of Architecture in India – From the Dawn of Civilization to the End of the Raj*. London. Phaidon Press Ltd.
2. Fletcher Sir Banister (1987). *A History of Architecture*. London (UK). Butter-worth Heinemann Ltd.
3. Arjun Dev, *The Story of Civilisation*, Vol. I (Old) NCERT History Textbook for Class IX.
4. Kostof Spiro(1995). *A History of Architecture – Settings and Rituals*. N.Y. Oxford University Press.
5. Hiraskar G.K.(1994). *The Great Ages of World Architecture*. Delhi. Dhanpat Rai Ltd.
6. Brown Percy (2004). *Indian Architecture- Buddhist and Hindu Periods*. Bombay. D.B. Taraporevala and Sons Co. Pvt. Ltd.

STRUCTURES - I			
Course Code	BAP 111	Credits	02
Contact Hours (Hrs/Week)	02	Semester	01
Course Category	BSAE		

INTRODUCTION

This subject gives insight about basic principles of structural mechanics which are relevant to simple design elements.

COURSE OBJECTIVES

- To understand basic principles of structural mechanics which are relevant to simple design elements.
- To understand structural behaviour of building elements.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to

Understand basic principles of structural mechanics.

Understand structural behaviour of building elements.

PEDAGOGY

Classroom teaching is supported by case studies.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1 : Applied Mechanics-I</u> <ul style="list-style-type: none"> • Nature Study: Study of structure in nature • Centre of Gravity: Definition, CG of plane figures (I, T, L, C, O), CG of hollow and box sections • Moment of Inertia: Definition, MI of plane figures about principal axes (rectangle, triangle, circle), Parallel axis theorem, MI of simple plane figures (I, T, L, C, O, hollow and box sections) 	07
2.	<u>Unit 2: Applied Mechanics-II</u> <ul style="list-style-type: none"> • Statics: Forces, Composition and Resolution of forces, Parallelogram law of forces, Lami's theorem, Moment and couple, Conditions of equilibrium • Concept of Elasticity: Hooke's Law, Stress and strain, Elasticity, Plasticity, Modulus of elasticity, Elastic limit, Stress/strain curve for mild steel, Poisson's ratio • Introduction to Temperature Stresses 	07
3.	<u>Unit 3: Building Structures-I</u> <ul style="list-style-type: none"> • Building Systems: Concept of load bearing wall and framed systems 	07

	<ul style="list-style-type: none"> • Building Components: Concept of distributing system, supporting system, opening system, spanning system • Spanning systems: Form-active and vector-active systems 	
4.	<u>Unit 4: Building Structures-II</u> <ul style="list-style-type: none"> • Historical perspective: Evolution of structures through time • Equations of Equilibrium: Statically determinate, Support conditions • Loads: Loads as forces, Types of loads (Dead, Live, Wind, Finishing, Snow, Earthquake, Blast, etc.) <p>Introduction to steel structures, connections (Riveted, Bolted and Welding</p>	07

REFERENCE BOOKS:

1. Kumar, A., "Stability Theory of Structures", Tata McGraw Hill Co. Ltd. 1985
2. Jain, A.K., "Strength of Materials and Structural Analysis", 2nd Ed., Nem Chand & Bros. 2008
3. Khurmi, R. S., "Strength of Materials", S. Chand Technical
4. Levy, M. and Salvadori, M., "Why Building Fall Down"
5. Levy, M. and Salvadori, M., "Why Building Stand up"
6. Salvadori, M., "Structure in Architecture"

CLIMATOLOGY AND ENVIRONMENTAL STUDIES – I			
Course Code	BAP 113	Credits	02
Contact Hours (Hrs/Week)	02	Semester	01
Course Category	BSAE		

INTRODUCTION

In this course the student shall understand Climate responsive architecture and understand and apply various principles underlying them.

COURSE OBJECTIVES

- The broad intent of the course is to develop the student's insight into the effect of climate and the incumbent of ecology of the sigh, in term of its effect of building design and detailing.
- The course is intended to develop a special insight into the current situation of urban immigration, climate change, environmental stress and pollution and help the student develop strategies to combat there. This could be developed both by looking around the site and by looking inside the proposed building itself, i.e., through its service design for water, electricity and space conditioning.

PREREQUISITE:NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Various components, elements and importance of climate and environmental study.
- Human thermal comfort as an essential function of a building, its analysis & use in Architecture.
- The elements constituting climate and their role in creating responsive designs.
- The characteristics of varied tropical climates and expected responses of buildings in specific climate types.
- importance of sustainable development and role of architecture.

PEDAGOGY

Classroom teaching through multimedia may be supported by visit to site of historical importance as per syllabus.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	Unit 1: Introduction to Climatology <ul style="list-style-type: none"> • Relationship between Architecture and Climatology; Global Warming and the Need for Climate responsive building; Building as a third skin. Climate and weather; Global weather; Seasonal changes, Factors responsible for changes. • Climatic-Tropics, climatic zones, macro climate, elements of climate, sun, temperature, wind, precipitation, and climatologically data needed for planning of buildings. • Human Comfort, Human heat balance and comfort; thermal comfort, heat stress, effective temperature, bioclimatic analysis, individuals' variation. Concept of Adaptive Comfort. 	07

2.	<u>Unit 2 : Micro climate</u> <ul style="list-style-type: none"> • Air Temperature: Factors that influence air temperature – latitude, altitude, seasons, water, trees, areas etc.; inversion of temperature, thermal diffusivity, thermal conductivity and heat transmission through building elements. • Solar Radiation and its variations over the year. • Wind: Study of diurnal and seasonal variations, heating and cooling, effect of topography; effect of wind on location on industrial areas, airports and other land uses and road patterns; Promoting and inhibiting air movement in and around buildings, wind eddies, size and positions; effect of wind on design and siting of buildings. Understanding Wind Rose diagrams. • Precipitation and humidity: Water vapor, relative humidity, condensation, rain, fog, snow and architectural responses to them. 	07
3.	<u>Unit 3 : Introduction to environmental studies</u> <ul style="list-style-type: none"> • The Multidisciplinary nature of environmental studies, Definition, scope and importance, Need for public awareness, man, environment and ecosystem; Renewable and nonrenewable resources: Natural resources and associated problems with case studies. • Ecosystems -Concept of an ecosystem, Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction to different ecosystems. 	07
4.	<u>Unit 4 : Introduction to Sustainable development</u> <ul style="list-style-type: none"> • Biodiversity and its conservation-Definition: genetic, species and ecosystem diversity. Biogeographical classification of India, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, Threats to biodiversity Conservation of biodiversity: in-situ, Ex-situ conservation of biodiversity. • Environmental Pollution, -Definition, Causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Noise pollution, Thermal pollution, nuclear hazards Solid waste Management. Role of an individual in prevention of pollution. • Disaster Management: Floods, earthquake, cyclone and landslides. 	07

REFERENCE BOOKS

1. Givoni, B. (1998). *Climate considerations in building and urban design*. New York: Van Nostrand Reinhold.
2. Bansal, N.K., Hauser, G. and Minke, G., "Passive Building Design: A Handbook of Natural Climatic Control", Elsevier Science. 1994
3. Hausladen, G., "Climatic Design: Solutions for Buildings that can Do More with Less Technology", Birkhauser. 2005
4. Drake, S., "The Third Skin: Architecture, Technology and Environment", UNSW Press. 2007.
5. Koenigsberger, O. H., Ingersoll, T. G., Mayhew, A. and Szokolay, S. V. "Manual of Tropical Housing and Building: Climatic design" Hyderabad : Orient Longman. 1980

ARCHITECTURAL WORKSHOP – I			
Course Code	BAP 115	Credits	01
Contact Hours (Hrs/Week)	02	Semester	01
Course Category	DCC		

INTRODUCTION

To equip students with the basic skills necessary to represent their ideas in simple models format using simple materials.

To make students practice with various tools essential for making architectural models.

COURSE OBJECTIVES

- To equip students with the basic skills necessary to represent their ideas in a rudimentary model format using simple materials like paper, thermocol, hardwood, Metals, glass fiber etc.
- Introduction to the various tools and equipment available for executing these exercises.

PREREQUISITE:NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Need for architectural models. Role of scale-models in design. General practices in model making. Types of models: block, detailed, construction & interior models.

PEDAGOGY

Classroom teaching through demonstrations /hands on activities.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
0	2	0	--	--	--	35	--	15	--	50	--

CONTENT

S. No	Contents	Contact Hours
1.	Architectural Modelling General information about various materials and tools to be used in model making. Development of the skill to use the tools with precision to obtain desired results in model making.	07
2.	Introduction to types of model Block models, detailed model, construction model and interior models etc.	07
3.	Introduction to various materials Experimentation with these materials for different geometries and scales of models.	07
4.	Introduction to various materials Methods of presentation in various types of models.	07

REFERENCE BOOKS

1. Ching, F. D. K. (2009). Architectural Graphics. 5th Ed. New Jersey : John Wiley & Sons.
2. Criss. B. M. (2011). Designing with models: A Studio guide to Architectural Process Models.3 rd Ed. Hoboken :John Wiley & Sons.

MATHEMATICS IN ARCHITECTURE			
Course Code	BAP 117	Credits	02
Contact Hours (Hrs/Week)	02	Semester	01
Course Category	BSAE		

INTRODUCTION

In this course the student shall understand the use mathematics by Architects for several reasons, leaving aside the necessary use of mathematics in the engineering of buildings. Understanding and use of geometry because it defines the spatial form of a building. Also the students shall explore and understand the application of mathematics to design forms that are considered beautiful or harmonious.

COURSE OBJECTIVES

- Identifying practical problems to obtain solutions involving trigonometric and exponential functions.
- Studying the properties of lines and planes in space, along with sphere
- Understand functions of more than one variable, along with differentiation under integral sign.
- Analyzing collection of data and interpretation of results using statistical tools.

PREREQUISITE:NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- The topics in mathematics necessary for effective understanding of architecture subjects. At the end of the course, the students would have knowledge of the appropriate role of the mathematical concepts learnt.

PEDAGOGY

Classroom teaching through multimedia may be supported by suitable assignments as per syllabus.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
5.	Unit 1: Mathematics in Architecture and Trigonometry and Mensuration Introduction to Mathematics in Architecture :Proportion, Golden ratio and Beauty, Scale, fractal design, Euclidean geometry, Understanding non-parallel surfaces, Symmetry and Anti-symmetry. Introduction to basic principles and concept of Fuzzy Logic. Review of Trigonometric (sine, cosine and tan functions) and exponential functions - De-Moiver's theorem - Expansion of $n \sin \theta$, $\cos \theta$ in terms of $\sin \theta$ & $\cos \theta$ and $n \tan \theta$ in terms of $\tan \theta$ - Real and Imaginary parts of Circular and Hyperbolic Functions - Area of plane figures, computation of volume of solid figures (cone, cylinder, prism, pyramid, sphere etc).	07
6.	Unit 2 : Three dimensional analytical geometry Direction cosines and ratio's – Angle between two lines – Equations of a plane –	07

	Equations of a straight line – Coplanar lines – Shortest distance between skew lines – Equation of Sphere – Tangent Plane to a Sphere. Translation/extrapolation of equations to Forms.	
7.	<u>Unit 3 : Integration and functions of two variables and ordinary Differential equations</u> Review of Integration of rational, trigonometric and irrational functions - properties of definite integrals - Reduction formulae for trigonometric functions ($n \sin \theta$, $\cos \theta$ & $n \tan \theta$) - Taylor's Theorem - Maxima and Minima (Simple Problems). Linear equations of second order with constant coefficients – Homogeneous equation of Euler type .	07
8.	<u>Unit 4 : Basic Statistics and Probability</u> Review of arithmetic mean, median, mode, standard deviation and variance - Regression and correlation - Elementary probability - Laws of addition and multiplication of probabilities - Conditional probability – Independent events – Baye's theorem (problems only).	07

REFERENCE BOOKS

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 41st Edition, 2011.
2. Bali N., Goyal M. and Watkins C., "Advanced Engineering Mathematics", Firewall Media (An imprint of Lakshmi Publications Pvt., Ltd.), New Delhi, 7th Edition, 2009.
3. Ramana B.V., "Higher Engineering Mathematics", Tata McGraw Hill Co. Ltd., New Delhi, 11th Reprint, 2010.
4. Greenberg M.D., "Advanced Engineering Mathematics", Pearson Education, New Delhi, 2nd Edition, 5th Reprint, 2009.
5. Salinas, N. A. (2006). A Theory of Architecture. Solingen : Umbau-Verlag.
6. BIPM. (2014). The International System of Units (SI). 8 th Ed. Bureau International des Poids et Mesures

B.ARCH SEMESTER II

Detailed Course Curriculum/Scheme of Examination-Semester 2

Bachelor's of Architecture, IGDTUW

Second Semester					
S.No.	Code	Subject	(L-S-P)	Credit	Category
1	BAP 102	Architectural Design-II	0-8-0	8	DCC
2	BAP 104	Building Materials & Construction Technology – II	0-5-0	5	BSAE
3	BAP 106	Architectural Drawing - II	0-4-0	4	DCC
4	BAP 108	Architectural Graphics -II	0-0-4	2	DCC
5	BAP 110	History of Architecture- II	2-0-0	2	DCC
6	BAP 112	Structures - II	2-0-0	2	BSAE
7	BAP 114	Climatology and Environmental Studies -II	2-0-0	2	BSAE
8	BAI 110	Programming with Python	3-0-2	4	BSAE
			Total	29	

- Departmental Core Courses (DCC)
- Humanities, Social Sciences, Management and Skill/Entrepreneurship Development Courses (HMC)
- Basic and Applied Science Courses (BSAE)
- Departmental Elective Courses (DEC)
- Generic Open Elective Courses (GEC)

ARCHITECTURAL DESIGN-II			
Course Code	BAP 102	Credits:	08
Contact Hours (Hrs/Week)	08	Semester	02
Course Category	DCC		

INTRODUCTION

This subject introduces students to the design of small buildings with respect to site including its various parameters.

COURSE OBJECTIVES

- To familiarize students with architectural design process pertaining to site specific conditions with emphasis on vernacular architecture, local geo climatic and socio-economic factors.
- To develop understanding of local geo climatic and socio-economic factors and how they shape architectural design
- To sensitize students towards designing in different climatic conditions.

PREREQUISITE: Student should have undertaken Course BAP 101.

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Design of small buildings, preferably in cold climate, with respect to site, especially its climatic conditions

PEDAGOGY

- Case studies along with primary and secondary surveys
- Models/sketches /perspectives to be included in key submissions for development of communication skills.
- Students may be encouraged to conduct simulations for passive climatic control as a design tool.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	8	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Proxemics <ul style="list-style-type: none"> • Study of human use of space and the effects that population density has on behaviour, communication, and social interaction through exercises. Impact of proxemics on architectural design • Sensitization towards application of principles of climatology. 	10
2.	Study of Vernacular Architecture <ul style="list-style-type: none"> • A visit to rural organic settlement (introduction to vernacular architecture) with repetitive composition with site orientation, prevailing wind direction and the use of local building materials. • Measure drawing of a small scale building (Can be part of the Vernacular Settlement study/visit) and/or elements of Architecture of any other building of architectural importance. Scale of the building should be small for thorough understanding of Measure Drawing principles. 	10
3.	Minor Design Problem/ Time Problem <ul style="list-style-type: none"> • Minor design problems such as a small weekend cottage, monument, food kiosk in a park. 	12
4.	Major Design Problem <ul style="list-style-type: none"> • Major design problem such as a house in a rural setting with focus on 	80

	<p>climatology and local materials and techniques. The structure may be load bearing type. Interrelation of design to construction, structures, climatology and building material Single room design, such as self-occupied room, tea stall, guard room, canopy, boundary wall etc.</p> <ul style="list-style-type: none"> • Development of understanding of load bearing structures for G+ 1 structure. 	
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REFERENCE BOOKS

1. Agkathidis, A., Hudert, M. and Schillig, G. (2007). Form Defining Strategies: Experimental Architectural Design. Wasmuth.
2. Watson, D. (Editor). (2005). Time-saver Standards for Architectural Design: Technical Data for Professional Practice, 8th Ed., McGraw-Hill.
3. Bansal, N.K., Hauser, G. and Minke, G. (1998). Passive Building Design: A Handbook of Natural Climatic Control. Elsevier Science.

Course Code	BAP 104	Credits	05
Contact Hours (Hrs/Week)	05	Semester	02
Course Category	BSAE		

INTRODUCTION

This course is designed to expose students to the process of building construction, the components of buildings and the materials, skills and equipment used in shaping them.

PREREQUISITE: Student should have undertaken Course BAP 103.

COURSE OBJECTIVES

- To acquaint students to basic building materials & construction technology associated with it.
- To familiarize students with basic building materials and their properties.
- To make students understand how materials can have architectural application.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Properties and behaviour of some readily available building materials.
- Designing and construction with the building materials.
- Application of available construction technology.

PEDAGOGY

Classroom teaching is supported with preparation of drawings and site visits.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	5	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Roofing systems <ul style="list-style-type: none"> • Flat, curved, sloping roofs • Timber roofs: Method of construction including terracing details; lean to roof, closed couple roof, collar roof for small spans and nail joineries. • Large timber trusses (12-meter span). • Roofing: Different types of roofing systems- investigation of roofing systems in vernacular traditions of India. Pitched timber roofs, Steel roofs 	25
2.	Staircases <ul style="list-style-type: none"> • Staircases: Different types of staircases, Special staircases in steel. Fire Escape Stair Cases. 	20
3.	Arches and Lintels Elementary principles of Arch construction. Definition of various technical terms and Types of Arches. Construction of Brick and Stone Arches.	15
4.	Building Materials <ul style="list-style-type: none"> • Timbers of India, Forest cover, Timber sawing and seasoning, timber products, roof tiles, and sheets, Introduction to secondary elements door, windows, railing and sunshades, staircase etc. 	10

	<ul style="list-style-type: none"> • Identification of basic woods like teak, sal, sheesham, mango, eucalyptus etc. 	
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REFERENCE BOOKS

1. Kumar, S.K. (2001) "Building Construction", 19th Ed., Standard Publishers Distributors.
2. Allen, E. and Iano, J. (2004) "Fundamentals of Building Construction: Materials and Methods", Wiley.
3. Mehta, M., Scarborough, W. and Armpriest, Diane. (2008) "Building Construction: Principles, Materials and Systems", Pearson Prentice Hall
4. Rangwala, S.C. (2001) "Building Construction", 19 th Ed., Charotar Publishing House
5. Mckay, W.B., (2005) "Building Construction", Vols. I, Longman.
6. Mckay, W.B., (2005) "Building Construction", Vols. II, Longman.
7. Mckay, W.B., (2005) "Building Construction", Vols. III, Longman.

ARCHITECTURAL DRAWING - II			
Course Code	BAP 106	Credits	04
Contact Hours (Hrs/Week)	04	Semester	02
Course Category	DCC		

INTRODUCTION

This course would enable students to visualize and draw what they have imagined in their minds and this is one of the effective tools for architects in communication with clients. This course would increase visualization power of student and would enable them for better designing.

COURSE OBJECTIVES

The objectives of the course are to:

- Equip students with the skill of being able to do the 3D representation of designs on a 2D plane for better understanding of designs.
- Introduce the students to graphic treatment of two-dimensional drawings.
- Develop perception and presentation of simple architectural forms and building.
- Sensitize students to application of sciography in development of solar passive architecture.
- Familiarize the students with preparation of perspectives by innovative methods.
- Introduce the students with perspectives of interiors.

PREREQUISITE: Student should have undertaken Course BAP 105.

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Draw effective presentation drawings for clients.
- Represent building / building elements in 3D for better understanding.
- Develop skills for 3D visualization of various elements.

PEDAGOGY

Classroom/ studio teaching shall be supported by study of drawing work / graphical representation through books / archival material/ reports/drawings/etc.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	4	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Section of Solids: <ul style="list-style-type: none"> • Section plans, Sections, True shape of a section. • Section of solids (Prisms, Pyramids, Cylinders, Cones, Spheres.) 	16
2.	Perspective <ul style="list-style-type: none"> • Definition of perspective technique (picture plane, stationary point etc.) and their role in drawing perspectives, • One point, two-point perspectives of geometrical shapes leading to 	16

	<p>perspectives of built forms, exercises in parallel, angular and bird's eye views.</p> <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. 	
3.	<p>Development of surfaces</p> <ul style="list-style-type: none"> • Introduction and Methods of development of surfaces. • Development of lateral surfaces of right solids like Cubes, Prisms, Cylinders. • Method of drawing the development of the lateral surface of a pyramid & Cone. 	16
4.	<p>Sciography</p> <ul style="list-style-type: none"> • Introduction/ Meaning of sciography • Projection of sciography in plan and elevations 	16

REFERENCE BOOKS

1. Bhatt, N.D. and Panchal, V.M., "Engineering Drawing – Plane and Solid Geometry", 48th Ed., Charotar Publishing House. 1996.
2. Griffin, A.W. and Brunicardi, V.A., "Introduction to Architectural Presentation Graphics", Prentice Hall. 1998.
3. Ciriello, M., "Architectural Design Graphics", McGraw-Hill. 2002.

ARCHITECTURAL GRAPHICS -II			
Course Code	BAP 108	Credits	02
Contact Hours (Hrs/Week)	04	Semester	02
Course Category	DCC		

INTRODUCTION

To enable students to develop the ability to present all the elements of design in graphic forms to enhance the potential of a student in presenting concepts and ideas in terms of drawing using different techniques.

COURSE OBJECTIVE

- To introduce the students to the various two- and three-dimensional Graphical techniques of Architectural drawings and to enhance their visualization skills.
- To introduce the students to graphic treatment of two-dimensional drawings.
- To develop perception and presentation of simple architectural forms and building.

PREREQUISITE: Student should have undertaken Course BAP 107.

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Draw effective presentation drawings for clients.
- Represent building / building elements in 3D for better understanding.
- Develop skills for 3D visualization of various elements.
- Use various rendering techniques and types of rendering methods for presentations.

PEDAGOGY

Classroom/ studio teaching shall be supported by study of drawing work / graphical representation through demonstrations, lectures, books / archival material/ reports/drawings/etc. and visit to various outdoor spaces.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
0	4	0	--	--	--	35	--	15	--	--	50

CONTENTS

S. No	Contents	Contact Hours
1.	Presentation Techniques <ul style="list-style-type: none"> • Introduction to represent different textures and finishes in plan and elevation. • Graphical representation of furniture, automobiles, human figures, etc. in plans and elevations and 3 dimensions. Preparation of presentation drawing. 	20
2.	Collage, Mural and Sculptures <ul style="list-style-type: none"> • Collage with paper and various waste materials with theme and presentation. Mural with different materials on live scale. Sculpture with different materials like P.O. P, clay, metal, wood, plastic, ceramic etc. • Study of Solids and voids to evolve sculptural forms and spaces and explore 	20

	the play of light and shade and application of colour. Analytical appraisal of building form in terms of visual character, play of light and shade, solids and voids etc.	
3.	Presentation Techniques: Digital <ul style="list-style-type: none"> • Introduction to vector and raster images, creating and saving images, image editing, understanding of layers, special effects etc. (Preferred software: Adobe Photoshop, Adobe Illustrator and Adobe after Effects). Rendering techniques using digital tools. • 3D Rendering: -Introduction to 3D Rendering, Simulating the Sunlight angle, adding shadows, Adding Materials and adjusting its appearance, adding a background scene, Effects with light, Adding Reflections and details with Ray Tracing, Creating and adjusting Texture maps, Adding Landscape and people and Improving your images and editing. 	10
4.	Introduction to other 3D medium like lithography,metal/wood Installation etc.	06

REFERENCE BOOKS

1. Bhatt, N.D. and Panchal, V.M., "Engineering Drawing – Plane and Solid Geometry", 48th Ed., Charotar Publishing House. 1996
2. Griffin, A.W. and Brunicardi, V.A., "Introduction to Architectural Presentation Graphics", Prentice Hall. 1998
3. Ciriello, M., "Architectural Design Graphics", McGraw-Hill. 2002
4. Ching, F.D.K., "Architectural Graphics", 4th Ed., John Wiley. 2003
5. Carpo, M., "Perspective, Projections and Design: Technologies of Architectural Representation", Routledge. 2008
5. Rasmusson, S.E., "Experiencing Architecture", Chapman and Hall Ltd,1964
6. Licklidan, H., "Architectural Scale", The Architectural Press. 1966
7. Ching. F.D.K., "Architecture Theoretician", Wiley. 2007
6. Fisher, T., "Architectural Design and Ethics: Tools for Survival", Architectural Press. 2008

HISTORY OF ARCHITECTURE-II			
Course Code	BAP 110	Credits	02
Contact Hours (Hrs/Week)	02	Semester	02
Course Category	DCC		

INTRODUCTION

This syllabus is an introduction to the early Iron Age civilizations and the associated architectural developments.

COURSE OBJECTIVES

- To understand early Iron Age civilizations and the architectural developments that took place during various locations of early Iron Age civilizations.
- To study the development of early Iron Age civilizations and their architectural implications.
- To study collapse of civilizations with respect to the hitherto studied topics.

PREREQUISITE: Student should have undertaken Course BAP 109.

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Iron Age architecture.
- Collapse of civilizations.

PEDAGOGY

Classroom teaching through multi-media.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1: Early Iron Age Civilizations in Greece</u> <ul style="list-style-type: none"> • Minoan, Mycenaean and Classical Greek Minoan and Mycenaean: Palace at Knossos, the Lion Gate, the appearance of the Megaron. Classical Greek: Developments in philosophy: Socrates, Aristotle, Plato; science; literature; Greek City states; • Evolution of the Temple; the Orders; the Parthenon, Temple of Zeus, Temple of Athena; Polis and Acropolis. 	07
2.	<u>Unit 2: Early Iron Age Civilizations in Rome</u> <ul style="list-style-type: none"> • Political, social, philosophical and military developments. • Structural and Engineering Achievements: the arch, vault and the dome; Developments of the orders; • Temples: Pantheon; Arenas: Colosseum; Thermae: Caracalla; Aqueducts; the forum and the basilica 	07
3.	<u>Unit 3 : Early Iron Age Civilisations in India</u> <ul style="list-style-type: none"> • Beginning of Hindu Temple Architecture under the Guptas and Chalukyas. 	07

	Appearance and Evolution: Experiments at Badami, Aihole of examples such as Ladh Khan, Durga, Maleguti	
4.	<u>Unit 4: Collapse of some civilizations</u> <ul style="list-style-type: none"> Causes of collapse with suitable examples; economical, environmental, social and cultural, natural disaster, overpopulation or resource depletion, lack of loyalty to a central power structure and result in an oppressed lower class rising up and taking power from a smaller wealthy elite, Foreign Invasions, Sub-replacement fertility. 	07

REFERENCE BOOKS

1. Tadgell Christopher (1990). A History of Architecture in India – From the Dawn of Civilization to the End of the Raj. London. Phaidon Press Ltd.
2. Fletcher Sir Banister (1987). A History of Architecture. London (UK). Butter-worth Heinemann Ltd.
3. Arjun Dev, The Story of Civilisation, Vol. I (Old) NCERT History Textbook for Class IX.
4. Kostof Spiro(1995) A History of Architecture – Settings and Rituals. N.Y. Oxford University Press.
5. Hiraskar G.K.(1994) The Great Ages of World Architecture. Delhi. Dhanpat Rai Ltd.
6. Brown Percy (2004). Indian Architecture- Buddhist and Hindu Periods. Bombay. D.B. Taraporevala and Sons Co. Pvt. Ltd.

STRUCTURES -II			
Course Code	BAP 112	Credits:	02
Contact Hours (Hrs/Week)	02	Semester	02
Course Category	BSAE		

INTRODUCTION

This subject gives insights about structural behaviour of Building Elements-trusses, design of building elements using Timber/Masonry/Steel.

COURSE OBJECTIVES

- To understand Structural behaviour of Building Elements used for distribution system.
- To understand design of building elements using Timber/Masonry/Steel.

PREREQUISITE: Student should have undertaken Course BAP 111.

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Structural behaviour of Building Elements used for distribution system.
- Design of building elements using Timber/Masonry/Steel.

PEDAGOGY

Classroom teaching is supported by case studies.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1: Axial load -I</u> <ul style="list-style-type: none"> • Columns: Definition, understanding through nature and history, Analysis, Design in Steel and timber using relevant BIS codes. • Walls and Piers: Definition, understanding through nature and history, Analysis, Design in masonry using relevant BIS codes. 	07
2.	<u>Unit 2: Axial load -II</u> <ul style="list-style-type: none"> • Foundation: Definition, understanding through nature and history, Analysis, Design in masonry using relevant IS codes. 	07
3.	<u>Unit 3: Eccentric and lateral load-I</u> <ul style="list-style-type: none"> • Columns: Understanding eccentric and lateral load, Analysis due to combined axial and eccentric loading, Design in Steel and timber using relevant IS codes. • Walls and Piers: Understanding eccentric and lateral load, Analysis due to combined axial and eccentric/ lateral loading, Design in masonry using relevant IS codes. 	07
4.	<u>Unit 4: Grillage Foundation</u> <ul style="list-style-type: none"> • Foundation: Understanding eccentric and lateral load, Analysis, Design in Steel using relevant IS codes. 	07

Reference books:

1. Dayaratnam, P., "Brick and Reinforced Brick Structures", Oxford & IBH Publishing Co. 1997
2. Arya, A.S., "Masonry and Timber Structures Including Earthquake Resistant Design", Nem Chand Bros. 2001.

CLIMATOLOGY AND ENVIRONMENTAL STUDIES- II			
Course Code	BAP 114	Credits:	02
Contact Hours (Hrs/Week)	02	Semester	02
Course Category	BSAE		

INTRODUCTION

In this course the student shall understand Climate responsive architecture and understand and apply various principles underlying them.

COURSE OBJECTIVES

- Equip the students with scientific background required to design climate responsive buildings, by offering a clear understanding of the various climatic zones and its climate responsive considerations in architectural design of building and built up areas
- List the different elements of climate classify them and Identify the factors of comfort
- Infer the impact of climatic forces on built structures and assessment of the effects of site, sun and wind in building response and understand designing of shelters in different climatic conditions.

PREREQUISITE: Student should have undertaken Course BAP 113.

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Human thermal comfort as an essential function of a building, its analysis & use in Architecture.
- The elements constituting climate and their role in creating responsive designs.
- The characteristics of varied tropical climates and expected responses of buildings in specific climate types.
- Utilize existing traditional/vernacular/ historical structures in the city as case study to learn the various attributes of climate & the desirable responses.

PEDAGOGY

Understanding tools & instruments utilized for measurement of climatic elements using the climatology lab. Documenting case studies of vernacular/ traditional/ historical buildings for understanding their responses to prevailing climate, Collecting and analysing data of temperature, humidity, radiation light & wind for specific cities and making solar charts, bioclimatic charts & Mahoney tables for the same as part of group assignments. Understanding of solar sun path diagram in 2D and 3D using prototypes and other tools.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1</u> <ul style="list-style-type: none"> • Understanding Solar Geometry & Building Orientational principles through Physical Models and through modeling software, for.e.g. Ecotect, Revit, Google Sketchup and other solar tools. • Study in relation to Sciography exercises in the Design Studio. 	07
2.	<u>Unit 2</u> <ul style="list-style-type: none"> • Understanding solar radiation and its effects on various kinds of surfaces (walls, roofs, Paved surfaces). • Calculation of solar radiation on building surfaces, solar charts. "Solar Heat gain 	07

	coefficient” for fenestration systems. Types of Shading Devices for buildings.	
3.	<u>Unit 3</u> <ul style="list-style-type: none"> • Opaque building elements and heat transfer through these surfaces/elements. U& R values for Building envelope elements. “Traditional and Modern” Insulation, Heat Absorbing and Reflective materials for walls, roofs and fenestrations. 	07
4.	<u>Unit 4</u> <ul style="list-style-type: none"> • Passive Architectural Design Principles in various climates. Case studies of Buildings and visits to Solar Passive structures and preparation and discussion of visit reports. • Design Exercise on small scale climatically responsive house/shelter together with modeling of solar insolation and exercises on shading devices. This can also be carried out in the Corresponding Architectural Design Studio. 	07

REFERENCE BOOKS:

1. Bansal, N.K., Hauser, G. and Minke, G., “Passive Building Design: A Handbook of Natural Climatic Control”, Elsevier Science. 1994
2. Givoni, G., “Climatic Considerations in Building and Urban Design”, Van Nostrand Reinhold. 1998
3. Hausladen, G., “Climatic Design: Solutions for Buildings that can Do More with Less Technology”, Birkhauser. 2005
4. Drake, S., “The Third Skin: Architecture, Technology and Environment”, UNSW Press. 2007.
5. Koenigsberger, O. H., Ingersoll, T. G., Mayhew, A. and Szokolay, S. V. (1980). Manual of Tropical Housing and Building: Climatic design. Hyderabad: Orient Longman.

Programming with Python			
Course Code	BAI-110	Credits	04
Contact Hours (Hrs/Week)	L-3 S-0 P-2	Semester	02
Course Category	BSAE		

INTRODUCTION:

Python is a versatile programming language, suitable for projects ranging from small scripts to large systems. It is widely used in many scientific areas for data exploration. This course will be useful for both text and data processing.

COURSE OBJECTIVE:

- To know the basics of algorithmic problem solving for reading and writing Python programs.
- To develop Python programs with conditions and loops.
- To use Python data structures — lists, tuples dictionaries.
- To define Python functions and call them.
- To do input/output with files in Python

PREREQUISITE: Nil

COURSE LEARNING OUTCOMES:

Having successfully completed this course, the student will be able to:

- Write python programs that solve simple business problems.
- Create python applications that are robust and multithreaded.
- Manage exceptions in Python
- Write simple GUI interfaces for a program to interact with users, and to understand the event-based GUI handling principles in python.

PEDAGOGY

Lectures will be imparted along with hands-on lab sessions and the latest real-world case studies where python can be used.

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1</u> <ul style="list-style-type: none"> • The Structuring Programming Principle, Program Structuring, Stepwise refinement, Introduction to Python programming language, The concept of data types, variables, assignments, immutable variables, numerical types, arithmetic operators, Data and Expressions, Literals, Variables and Identifiers, Understanding error messages, Conditions, Boolean Logic, Logical Operators, ranges, Control statements: if-else, loops (for, while); 	10
2.	<u>Unit 2</u> <ul style="list-style-type: none"> • Strings and text files; manipulating files and directories, os and sys modules; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file (csv or tab separated); String manipulations: subscript operator, indexing, slicing a string, Lists, Tuples, and Dictionaries; basic list operators, replacing, inserting, removing an element; searching and sorting lists; dictionary literals, adding and removing keys, accessing and replacing values; traversing dictionaries; Function, Execution of A Function, Keyword and Default Arguments, Scope Rules. 	10
3.	<u>Unit 3</u> <ul style="list-style-type: none"> • Exception, Testing and Debugging: Handling if exceptions to handle the code cracks, handling and helping file operations, coding with the exceptional handling and testing Anonymous method, Properties, Indexers, Exception 	10

	Handling	
4.	<u>Unit 4</u> <ul style="list-style-type: none"> Python packages: Simple programs using the built-in functions of packages like matplotlib, numpy, pandas etc., Graphical user interfaces; Tkinter introduction, Tkinter and Python Programming, event-driven programming paradigm; creating simple GUI; buttons, labels, entry fields, dialogs; widget attributes - sizes, fonts, colors layouts, nested frames. 	10

Textbooks

1. C. Dierbach, Introduction to Computer Science Using PYTHON: A Computational Problem-Solving Focus (1st Edition), Wiley, 2015.
2. Let Us Python, Yashavant Kanetkar, BPB Publishers, 2019, 1st edition

Reference Books

1. Allen B. Downey, Think Python: How to Think Like a Computer Scientist (2nd Edition), O'Reilly, 2016.
2. Martin C. Brown, Python: The Complete Reference (4th Edition), McGraw-Hill, 2018.

Syllabus of 3rd Sem B.Arch. (CBCS)

Department of Architecture and Planning, IGDTUW

Detailed Course Curriculum/Scheme of Examination-Semester III
Bachelor of Architecture, IGDTUW

SECOND YEAR					
Third Semester					
S.No.	Code	Subject	(L-S-P)	Credit	Category
1	BAP 201	Architectural Design – III	0-10-0	10	DCC
2	BAP 203	Building Materials & Construction Technology – III	0-5-0	5	BSAE
3	BAP 205	Computer Aided Design Techniques - I	0-0-4	2	HMC
4	BAP 207	History of Architecture- III	2-0-0	2	DCC
5	BAP 209	Structures – III	2-0-0	2	BSAE
6	BAP 211	Theory of Design-I	2-0-0	2	DCC
7	BAP 213	Building Services-1: Water Supply & Sanitation	2-0-0	2	BSAE
8	BAP 215	Advanced Surveying and Levelling	0-0-2	1	BSAE
			Total	26	

- Departmental Core Courses (DCC)
- Humanities, Social Sciences, Management and Skill/ Entrepreneurship Development Courses (HMC)
- Basic and Applied Science Courses (BSAE)
- Departmental Elective Courses (DEC)
- Generic Open Elective Courses (GEC)

ARCHITECTURAL DESIGN-III			
Course Code	BAP 201	Credits	10
Contact Hours (Hrs/Week)	10	Semester	03
Course Category	DCC		

INTRODUCTION

This subject introduces students to the idea of space making with emphasis on process, abstraction, and modes of representation.

COURSE OBJECTIVES

- To develop understanding of interconnections between form, volume and function.
- To sensitize students towards the interconnectedness of various elements of a context which impact the architectural design.

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- To foster understanding about the impact of geo climatic context on the elements of built spaces.
- To develop sensitivity to shapes, forms and built volumes.
- How local geo climatic and socio-economic factors shape architectural design in vernacular architecture.
- Design for small public space.

PEDAGOGY

- Case studies along with primary and secondary surveys, involving field visit of outstation site if required.
- Documentation of various data collected from case studies, research and literature studies.
- Models and sketches.
- Synergy of various layers of data and its application in a small-scale space design.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	10	--	--	--	50	--	--	-	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Site Analysis Climatic consideration for the design, orientation of building on site their application in elevations as functional/aesthetic solutions will also be a part of the design exercise.	30

	Contextual Understanding Study of the context and elements of built and un- built spaces in an observable setting to develop the understanding of socio-cultural attributes of the physical environment, methods of construction emerging out of the way of life of the people in a given place including topographical and climatic survey.	
2.	Minor Problem Exercises related to understanding user's behaviour and context and needs and documenting various pattern and using it to develop designs may be explored to develop design. Exercises relate to Spatial organisation. Understanding aesthetic appeal, functional quality and elementary structural concepts required to evolve the specific form.	40
3.	Major Problem Small public building with repetitive elements (school, small hospital, office, housing) activity in a non-urban setting, or a situation without urban regulatory controls. The project would address the study of built form and its relationship to the site, surroundings and the climate. Design proposals shall be based on the site and basic climate analysis.	70

REFERENCE BOOKS

1. Ching, F. D. K. (2012). Architecture: Form, Space and Order. 3rd Ed. Hoboken: John Wiley & Sons.
2. Agkathidis, A., Hudert, M. and Schillig, G. (2007). Form Defining Strategies: Experimental Architectural Design. New York: Wasmuth.
3. Watson, D. (Editor). (2005) Time-saver Standards for Architectural Design: Technical Data for Professional Practice, 8th Ed., McGraw-Hill.
4. Shah M.G, Kale C.M, Patki S. Y. (2002). Building drawing with an integrated approach to Built Environment, Tata McGraw-Hill Education.
5. Neufert, P. (2000). Architects Data. 3rd Ed. UK: Blackwell Wiley.
6. Ching, F.D.K and Juroszek, S.P (1998). Design Drawing. New York: Van Nostrand Reinhold.

BUILDING MATERIALS & CONSTRUCTION TECHNOLOGY-III			
Course Code	BAP 203	Credits	05
Contact Hours (Hrs/Week)	05	Semester	03
Course Category	BSAE		

INTRODUCTION

This course introduces students to the manufacturing process and properties of various composite materials. Further the course details out construction details of different types of doors and windows in timber and metal.

COURSE OBJECTIVES

- To acquaint students to properties, usage and application of composite building materials commonly used.
- To make students understand the various typologies of doors and windows.
- To familiarize students with different technology/ techniques used for construction of wooden and metal doors & windows.

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand the appropriate application of composite building materials in different contexts.
- Understand the complete joinery and fabrication details of doors and windows in timber and metal.
- Equip themselves with suitable construction technique/ technology as per building usage and demand.

PEDAGOGY

Classroom teaching is supported with preparation of drawings and may also be supported with site visits.

EVALUATION SCHEME

COURSE TYPE			EXAMINATION		RELATIVE WEIGHTS						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	5	--	--	--	50	--	--	--	--	50

CONTENT

S. No.	Contents	Contact Hours
1.	<u>Unit 1</u> Building materials: Composite materials: R.C.C. and R.B.W, Use of Bamboo for Reinforcement, Water proofing materials and systems for basement, Ferrocement, steel, laminated timber, brick cladding, Structures like ferrocement channels, plank and joist.	15
2.	<u>Unit 2</u> Doors and Windows: Doors: Types of doors, construction techniques, decorative panel	35

	doors, glazed doors, flush doors, doors with fanlight, and calculation of woodwork, frameless doors. Windows: Detail of timber frames & shutters, fixed shutters, Calculation of woodwork. Frameless window details.	
3.	<u>Unit 3</u> Metal doors: Doors: Different types of doors in steel, Aluminium and Glass. Sliding, Sliding and folding, revolving doors. Fireproof and Soundproof doors. Types of Rolling Shutters.	15
4.	<u>Unit 4</u> Metal windows: Windows: Different types of windows in Steel, Aluminium and Glass. Sliding windows in Steel and Aluminium	15

REFERENCE BOOKS

1. Francis D.K. Ching (2011). Building Construction Illustrated. John Wiley & Sons.
2. Punamia B.C., Jain Ashok Kr., Jain Arun Kr. (2008), Building Construction, 10th Ed., Laxmi Publications Pvt Limited
3. McKay, W. B. (2005). Building Construction Metric Vol., I–IV. 4th Ed. Mumbai: Orient Longman.
4. Kumar, S.K. (2001). Building Construction, 19th Ed., Standard Publishers Distributors.
5. Rangwala, S.C. (2001) Building Construction, 19 th Ed., Charotar Publishing House.

COMPUTER AIDED DESIGN TECHNIQUES-I			
Course Code	BAP 205	Credits	02
Contact Hours (Hrs/Week)	04	Semester	03
Course Category	HMC		

INTRODUCTION

This course is designed to introduce students to the application of various software and hardware related to Architecture curriculum.

COURSE OBJECTIVES

The objectives of the course are to:

- To familiarize students with basic computer use.
- Brief description of various hardware and software.
- Basic knowledge of various operating systems i.e. windows, Linux etc.
- Basic introduction to software available for architectural applications.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Apply the softwares in the design and other assignments.
- Use the techniques for better design scalability and presentation.
- Achieve better visualisation and imagination.

PEDAGOGY

Classroom teaching may be supported with lectures, tutorials, study of archival material, reports, and drawings etc.

EVALUATION SCHEME

COURSE TYPE			EXAMINATION		RELATIVE WEIGHTS						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP*
0	4	0	Yes	--	--	35	--	15	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Introduction to Computers & Commonly Used Software Brief Description of various Hardware and Software, Basic knowledge of different operating systems i.e. Windows, Unix, Linux etc. Introduction of various software available for documentation, presentation & drawing purposes, Familiarizing the use of scanners, printer's plotters etc. Microsoft Word, Microsoft Power Point, Microsoft Excel, Adobe Page Maker	8

2.	Auto Cad <p>Introduction to CAD, Intro to AutoCAD/ Precision Drawing & Drawing Aids/ Geometric Shapes Setting up & controlling the AutoCAD drawing environment – Creating & Editing Commands, Organizing a drawing with layers Advanced geometry editing – Creating & using Blocks – Inquiry Tools – AutoCAD Design Center, Internet and collaboration ,Blocks, Drafting symbols, Attributes, Extracting data Attributes – understanding object linking and embedding – Importing objects into AutoCAD using OLE working with OLE objects., Text annotation – Creating & Customizing Hatch patterns – Productive Dimensioning – Defining Text & Dimension Styles Printing & plotting - creating a slide presentation – Drawing utilities – importing / exporting files.</p> <p>Introduction to the programming of AutoCAD CAD .Understanding <u>Object ARX®</u> programming environment with the object-oriented C++ programming interfaces, AutoCAD .NET API, the complete <u>Visual LISP®</u> development environment and the ActiveX® interface.</p>	12
3.	Revit/BIM <p>Introduction to contemporary practices such as Building Information Modelling and Revit.</p>	16

REFERENCE BOOKS

1. Farrelly Lorraine, Crowson Nicola (2014). Representational Techniques for Architecture (Basics Architecture), 2nd Revised edition Bloomsbury
2. Aouad Ghassan, Wu Song, Lee Angela, Onyenobi Timothy (2014). Computer Aided Design Guide for Architecture, Engineering and Construction. New York: Routledge
3. Omura George, Benton Brian C (Jul 2014). Mastering AutoCAD 2015 and AutoCAD LT 2015, Autodesk official press.
4. Fiorello J.A (2010). CAD for Interiors beyond the Basics. Hoboken, New Jersey: John Wiley & Sons, Inc.
5. Trivedi M.C. (2009). Computer Graphics & Animation. 1st edition Jaico Publishing House
6. Groover M, (2003). Computer Aided Design and Manufacturing, 1st edition Pearson Education.
7. Grabowski Ralph (2002). The Illustrated AutoCAD 2002 Quick Reference. First Edition Cengage Learning

HISTORY OF ARCHITECTURE-III			
Course Code	BAP 207	Credits	02
Contact Hours (Hrs/Week)	02	Semester	03
Course Category	DCC		

INTRODUCTION

Architecture is one of the products of civilization. It is a combined outcome of various factors such as geology, geography, climate, belief systems, religion, society, politics, economy, culture and way of life. This syllabus revolves around the architectural history civilizations of medieval ages in Indian subcontinent and rest of the world.

COURSE OBJECTIVES

- To study the development of civilizations and evolution of architecture as a manifestation of the world views, geo climatic and socio-economic factors.
- To study and generate understanding about the Buddhist, Hindu, Islamic and European Renaissance architecture.

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Development of civilizations.
- Evolution of architecture through times.
- Understand the impact of various factors such as geology, geography, climate, beliefs, religion, society, politics, economy, culture and way of life on architecture.

PEDAGOGY

Classroom teaching through multi-media may be supported by visit to site of historical importance as per syllabus.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP#
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	Unit 1 Architecture of Buddhist origin and associations in India Sri Lanka Far Eastern Countries Tibet China Japan Viharas Chaityas and Stupas and Monasteries North Indian Temple architecture (circa 6th –12th C).	07

2.	Unit 2 Important temples in North and Central India. Temples of Orissa. Khajuraho etc. South Indian temple architecture under the Chalukyas, Pallavas, Cholas, Pandyas and important temples like Meenakshi, Brihadishwara etc	07
3.	Unit 3 Architecture of Medieval & Modern Western World –I Introduction to Islamic architecture: Islam and its philosophy, its implementation in various building types such as mosque, tomb, fort and their elements like domes, minarets, arch etc.	07
4.	Unit 4 Architecture of Medieval & Modern Western World -II Orthodox Christian, Byzantine &, Venice, Constantinople Romanesque Ecclesiastical Gothic Architecture in Continental Europe and England. Great Cathedrals - Notre Dam, Canterbury, etc.	07

REFERENCE BOOKS

1. Brown Percy (2014). Indian Architecture (Islamic Period). Bombay: D.B.Taraporevala and Sons Co. Pvt. Ltd.
2. Grover Satish (1996). Islamic Architecture In India. Galgotia Pub.Co., New Delhi.
3. Tadgell Christopher (1990). A History of Architecture in India – From the Dawn of Civilization to the End of the Raj. Phaidon Press Ltd., London.
4. Fletcher Sir Banister (1987). A History of Architecture.Pub. Butter-worth Heinemann Ltd. 19th edition London (UK), Indian collaboration- CBS Pub. Delhi.

STRUCTURES - III			
Course Code	BAP 209	Credits	02
Contact Hours (Hrs/Week)	02	Semester	03
Course Category	BSAE		

INTRODUCTION

This subject will familiarize students with the structural designing of roof spanning structures like trusses (short span) and beams.

COURSE OBJECTIVES

- To familiarize the student with designing aspects associated with short span trusses and beams.
- To help students analyse the behaviour of these structural members in terms of Deflection and Stresses.
- To introduce students to different typologies of these systems.

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand various typologies of spanning members.
- Understand bending and shear stresses in Trusses and Beam, in both symmetrical and asymmetrical sections.
- Carry out structural analysis of Beams.

PEDAGOGY

Classroom teaching may be supported by case studies, site visits, photo documentation and hands on exercises.

EVALUATION SCHEME

COURSE TYPE			EXAMINATION		RELATIVE WEIGHTS						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP*
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1: Trusses</u> Design of steel truss up to short span, Method of analysing (Method of section, Method of joint and Graphical Method). Effect of Wind load on Truss.	07
2.	<u>Unit 2: Stresses in Beam</u> Bending Stress in Beam: Bending equation, bending stresses in symmetrical and asymmetrical sections. Shear stress distribution in various sections.	07
3.	<u>Unit 3: Beams</u>	07

	Simply supported and cantilever, understanding through nature and history, Analysis, Draw Shear Force Diagram (SFD) and Bending Moment Diagram (BMD).	
4.	Unit 4: Deflection in Beams Double integration method, Moment area method, Conjugate beam method.	07

REFERENCE BOOKS:

1. Kumar, A. (1985). Stability Theory of Structures, Tata McGraw Hill Co. Ltd.
2. Jain, A.K. (2008). Strength of Materials and Structural Analysis, 2nd Ed., Nem Chand & Bros.
3. Ramamrutham, S (2014). Theory of Structures, Dhanpat Rai Publications,
4. Hibbeler, R.C (2019). Structural Analysis , 10th edition, Pearson Publication

THEORY OF DESIGN – I			
Course Code	BAP 211	Credits	02
Contact Hours (Hrs/Week)	02	Semester	03
Course Category	DCC		

INTRODUCTION

The courses in Design theory aims to evolve a conceptual framework for nuanced understanding and appreciation of Architecture and to develop a vocabulary for discussing design ideas.

COURSE OBJECTIVES

To understand and comprehend ideas in architecture through writings in architecture

- To appreciate architecture as the development of changing ideas over time, and as the representation of their time and context.
- To be able to chart the change of ideas chronologically over time.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will:

- become familiar with and improve comprehension about architecture using theoretical texts and architectural criticism.

PEDAGOGY

Seminars, Tutorials/ additional classes for any course, Guest Lectures, putting up Exhibitions, Workshops, participating in Architectural Competitions or conducting Site Visits or Study Tours.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1: Introduction</u> Definitions of Architecture - Origin of Architecture – Architecture as a discipline – Context for architecture as satisfying human needs - Functional, aesthetic and psychological. Introduction to the formal vocabulary of architecture and Gestalt ideas of visual perception. Design methodology: Design as a multi-variety problem solving process.	07
2.	<u>Unit 2: Elements of Architecture-Form and Space</u> Understanding fundamental principles such as proportion, scale, balance, symmetry/asymmetry, rhythm, axis, hierarchy, datum,	07

	unity, harmony, dominance – detailed study of relationship between architectural form and circulation. Understanding perceptual effects of specific geometric forms such as sphere, cube, pyramid, cylinder and cone and specific configuration of architectural spaces – Enclosure – Internal and External, Continuous spaces.	
3.	Unit 3: Architecture as socially useful discipline The concept of measuring, function, style, type, social purpose and ideology, the relationship of architecture to the sciences, arts, economics and politics. Study of selected writing, buildings or manmade design at all levels including objects of daily use.	07
4.	Unit 4: Issues in Contemporary architecture Theoretical issues in contemporary architecture, Study on the works of selected Indian and International Architects and related topics.	07

REFERENCE BOOKS:

1. Ching, F.D.K. (1979). Architecture – Form, Space and Order. Van Nostrand Reinhold Company.
2. Lang, J., Desai, M. and Desai, M. (2000). Architecture and independence: The search for identity – India 1880 to 1980. New Delhi: Oxford University Press.
3. Lang, J.T (2002). A Concise History of Modern Architecture in India.
4. Eisenman, P. (1999). Diagram Diaries. New York: Universe.
5. Heidegger, M. (1993). Building Dwelling Thinking. Basic Writings. HarperCollins.
6. Lefebvre, H. (1991). The production of space. Oxford: Cambridge.
7. Pallasmaa, J. (2005). The eyes of the skin: Architecture and the senses. Chichester: Wiley Academy.
8. Pandya, Y. (2007). Elements of Space making. Ahmedabad: Mapin.
9. Tschumi, B. (1994). Architecture and disjunction. Cambridge, Massachusetts: MIT.
10. Venturi, R. (1966). Complexity and Contradiction in Architecture. New York: The Museum of Modern Art.
11. Vitruvius, P. and Morgan, M. H. (1960). Vitruvius: The ten books on architecture. New York: Dover Publications.
12. Borngasser Barbara (Reprint edition 2010). History of Architecture: From Classic to Contemporary, Parragon Inc

BUILDING SERVICES-I (WATER SUPPLY AND SANITATION)			
Course Code	BAP 213	Credits	02
Contact Hours (Hrs/Week)	02	Semester	03
Course Category	BSAE		

INTRODUCTION

Services are integral part of any building without which the building cannot function. It is important for an architect to know how services related to water supply and sanitation are designed and integrated in any building. This course introduces the students to various concepts, components and aspects related to sustainable water supply and sanitation in the building.

COURSE OBJECTIVES

Having successfully completed this course, the student will be able

- To prepare students to be able to design an effective and efficient water supply and drainage system for any building.
- To develop understanding of water supply and sanitation system with emphasis on sustainability.
- To develop understanding of functioning various fittings used in water supply and sanitation system.
- To understand the concept of wastewater recycling and methods of water conservation.
- To learn about drainage system / planning of bathrooms through layout exercise.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand the types, sizes, joining, use and functions of various fittings used in water supply and drainage system.
- Plan for sustainable, effective and efficient water supply and drainage system for a building.
- Learn various methods for conservation of water.

PEDAGOGY

Classroom teaching may be supported by site visit, market survey, preparation of construction drawings and hands-on activity etc.

EVALUATION SCHEME

COURSE TYPE			EXAMINATION		RELATIVE WEIGHTS						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP*
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1: Water supply:</u> Sources of water supply, The Water Crises, Impurities of water and	10

	systems of water supply, Various kinds of water meters, Water storage tanks, their capacity and location. Calculation of water consumption based on types of building occupancies. Water Balance, Domestic hot and cold-water supply systems. Solar Hot water heating systems for domestic and industrial usage, Size of pipes and their joining details. Connections of different sanitary fittings like ferrule, stopcocks, bib cocks etc. Efficiency in Watering of Landscape & Crops, Drip Irrigation, Hydroponics), Stormwater drainage, Rainwater Harvesting & Groundwater Recharge.	
2.	Unit 2: Sanitation: Basic principles of sanitation and disposal of waste matter from buildings, Dry and wet carriage systems, Sanitary fittings- washbasins, WC's, bathtubs, sink, urinals, bidets, flushing cistern, traps etc. Low flow fixtures and Waterless fixtures with calculation of flow rates and water usage, Various types of joints, manholes and septic tanks. Proper location and ventilation of intercepting chambers and inspection chambers, Drainage systems- separate, combined and partially combined systems. Single stack system. One pipe and two pipe systems, Testing of house drains. Gradients used in laying drains and sewers. Self-cleaning and non-scouring velocities for drainpipes, Size of drainpipes and materials used, Innovative and Cost-Effective Sanitation concepts. E.g. EcoSAN, Rural & Distributed Sanitation Concepts.	08
3.	Unit 3: Concept of wastewater recycling Methods of treating wastewater- STP's and ETP's, conventional methods, improvised methods, additives, Conserving Water- overview & Zero discharge concepts and calculations for the same, Methods of water conservation.	06
4.	Unit 4: Plumbing Layouts exercises Exercises in layout of simple drainage systems for small buildings. Planning of bathrooms and lavatory blocks in domestic and multi-storied buildings. Exercises can also be clubbed with design studio project.	04

TEXTBOOKS

1. Mohan CR and Vivekanand (2014). Design & Practical Handbook on Plumbing, Standard Publishers Distributors.
2. Garg, S. K. (2009). Environmental Engineering, Vol. II, Khanna Publications, New Delhi
3. Duggal, K. N. (2008). Elements of Environmental Engineering, S Chand and Co. Ltd., New Delhi.
4. Birdie, G. S., and Birdie, J. S. (2007). Water Supply and Sanitary Engineering, Dhanpat Rai and Sons, New Delhi.
5. Rangwala, S. C. (2005). Water Supply and Sanitary Engineering, Charoter Publishing.
6. Pachauri, A.K. (1999). Water Supply and Sanitary Installation, Design, Construction and Maintenance, New Age International Ltd.

7. Greeno, Roger (1997). Building Services Technology and Design, Longman Scientific and Technical, Harlow.
8. Wise, A.F.E. and Swaffield, J.A. (1995). Water Sanitary Services for Buildings, Longman Scientific and Technical, Harlow.

REFERENCE BOOKS

1. Handbook on Technological Options for On-site Sanitation in Rural Areas, published by Ministry of Drinking water & sanitation, Government of India, 2016
2. Handbook on Drinking water treatment & technologies, prepared by National Environmental Engineering Research Institute (CSIR-NEERI), Nagpur and issued by Ministry of Drinking Water & Sanitation, Government of India, 2011
3. Revised Guidelines for Swachh Bharat Mission Gramin, published by Ministry of Drinking Water & Sanitation, Government of India, 2017
4. Bureau of Indian Standards. 1995
5. National Building Code of India. 2016
6. Manas Handbook of Plumbing, Manas Publishers.

ADVANCED SURVEYING AND LEVELLING			
Course Code	BAP 215	Credits	01
Contact Hours (Hrs/Week)	02	Semester	03
Course Category	BSAE		

INTRODUCTION

This subject gives insight about various surveying techniques and develops understanding relevance of land topography for designing and planning.

COURSE OBJECTIVES

- To introduce the student with different principles of surveying and levelling.
- To equip student with the knowledge and skill of representing a 3D area on a 2D plan.
- To make students understand how site contours are delineated and analysed for optimum design solution.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand various surveying and levelling methods.
- Analyse and prepare survey drawings.
- Prepare contour map of terrain and propose optimum utilization of the project site.

PEDAGOGY

Classroom teaching may be supported by practical of surveying and hand on activity etc.

EVALUATION SCHEME

COURSE TYPE			EXAMINATION		RELATIVE WEIGHTS						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP*
0	2	0	Yes	--	--	35	--	15	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1 Introduction</u> Introduction to surveying, understanding land topography and its relevance in Architecture. Types of surveys in practice. Introduction to survey equipment. Principles of survey, equipment required selection of station, methods of taking offsets. Booking the field notes, obstacles in chaining, errors in chaining, chaining on sloping ground and reciprocal ranging.	06

2.	<u>Unit 2: Compass Surveying</u> The prismatic compass, its construction and uses. Other types of compasses. Reduced and whole circle bearing, magnetic declination, effects of local attraction. Compass traverse and balancing the closing error.	08
3.	<u>Unit 3: Levelling and Contouring</u> Different types of levels, their temporary and permanent adjustment, levelling staff. Book of the readings and reduction of levels. Errors in levelling. Curvature and refraction reciprocal levelling profile, levelling cross sections. Plane Tabling: Equipment and methods. Two points and three points' problems. Contouring: Characteristics of contour lines, direct and indirect methods of contouring and interpolation of contours. Interpretation and preparation of contour maps.	08
4.	<u>Unit 4: Theodolite Surveying</u> Theodolite Surveying: Theodolite, its temporary and permanent adjustment, measuring of magnetic bearings, horizontal and vertical angles. Theodolite traverse and balancing the closing error. Total station theodolite. Tacheometric Surveying: General instruments, different systems of tacheometric measurements, stadia method, Subtense method. Introduction to Site modelling with total station survey (TSS) and demonstration exercise (videos) in setting out of building works. Process of Measurements of coordinates and elevations of objects from various points and minimising the errors with traversing with TSS.	06

TEXTBOOKS

1. Punmia B. C., Jain Ashok, Jain Arun K. (2016). Surveying (Volume I & II). 17th edition 2016 Laxmi Publications
2. Schofield, W. and Breach, M. (2007). Engineering Surveying, 6th Ed., Butterworth-Heinemam.
3. Chandra, A. M. (2002). Surveying. New Age Publishers.
4. Singh Harbhajan (2014). Surveying and Levelling for Architects, 1st edition Abhishek Publications

REFERENCE MATERIAL

1. Online Latest Manual on Application of Land Surveying Instruments, i. e. Total Station Survey, DGPS etc.

B.ARCH SYLLABUS

SEMESTER IV

(CBCS)

Detailed Course Curriculum/Scheme of Examination-Semester IV
Bachelor of Architecture, IGDTUW

Fourth Semester				
Code	Subject	(L-S-P)	Credit	Category
BAP 202	Architectural Design-IV	0-10-0	10	DCC
BAP 204	Building Materials & Construction Technology – IV	0-6-0	6	BSAE
BAP 206	Computer Aided Design Techniques - II	0-0-4	2	HMC
BAP 208	History of Architecture- IV	2-0-0	2	DCC
BAP 210	Structures – IV	2-0-0	2	BSAE
BAP 212	Specifications, Quantities & Estimation	2-0-0	2	DCC
BAP 214	Building Services-II: Illumination & Electrical Design	2-0-0	2	BSAE
BAP 216	Art & Design Appreciation	0-2-0	2	DEC
BAP 218	Art in Architecture			
BAP 220	Graphic and Product Design			
*	Any Other Elective (s)			
		Total	28	

- Departmental Core Courses (DCC)
- Humanities, Social Sciences, Management and Skill/Entrepreneurship Development Courses (HMC)
- Basic Science and Applied Engineering Courses (BSAE)
- Departmental Elective Courses (DEC)
- Generic Open Elective Courses (GEC)

ARCHITECTURAL DESIGN-IV			
Course Code	BAP 202	Credits	10
Contact Hours (Hrs/Week)	10	Semester	04
Course Category	DCC		

INTRODUCTION

To understand how volume, shape, size, form and architectural detailing of built environment is shaped and impacted by various factors like human behaviour, climate, materials, micro and macro level contextual issues, and environmental variables.

COURSE OBJECTIVES

- To develop an understanding that designing is a process and not just an end product.
- To develop a holistic understanding of how socio-cultural-economic and geo climatic factors shape architecture.
- To sensitize students towards a more user centric design process of building and open spaces.
- To develop an understanding of data collection and analysis of physical and demographic factors
- Experimentation with shapes and forms to evolve sensitivity to built volumes.

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to :

- Understand how rich, meaningful and responsive user experiences can be created through design of built environment.
- Understand how design of built environment can create a synergistic relationship with the context in which it is placed.
- Create meaningful built environment in the context of small scale projects that involve simple function, application of building services and user experience.

PEDAGOGY

- Literature study and Case study of projects having similar style to studio design assignment.
- Documentation of various data collected from case studies, research and analysis.
- Models and sketches.
- Synergy of various layers of data and its application in architectural design.
- Outstation/Local architectural tour/site visits may be conducted.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	10	--	--	--	50	--	--	-	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Site Analysis <ul style="list-style-type: none">Comprehensive Site analysis at the beginning of each design problem. This would develop sensitivity to existing site conditions, socio-cultural attributes, environment, context, climatic conditions, etc. and help students evolve design directives to guide the design process.	20
2.	Minor Problem One time problem of a small community building	10
3.	Major Design project <ul style="list-style-type: none">The project would address the study of built environment and its relationship to the site, surroundings, socio economic contextual issues and geo-climatic setting. Design proposals to be responsive to climatic, physical settings, and the local context. The design problem would induce students to experiment with built and open spaces.Block models at every design stage for three- dimensional visualization.The project would involve the study of simple repetitive type of spaces like hostels, commercial centre, offices, etc. The focus may be on the evolution of form through a detailed site analysis.	90
4.	Architectural Detailing <ul style="list-style-type: none">Detailing of selected areas (of the major design problem) to introduce a working understanding of services.Integration of design ideas with structural feasibility.Evolving working solutions for parking and circulation patterns.	20

REFERENCE BOOKS

1. Ching, F. D. K. (2012). Architecture: Form, Space and Order. 3rd Ed. Hoboken: John Wiley & Sons.
2. Agkathidis, A., Hudert, M. and Schillig, G. (2007). Form Defining Strategies: Experimental Architectural Design. New York: Wasmuth.
3. Ballard Bell, Victoria and Rand, P. (2006). Materials for Architectural Design, Laurence King.
4. Watson, D. (Editor). (2005) Time-saver Standards for Architectural Design: Technical Data for Professional Practice, 8th Ed., McGraw-Hill.
5. Shah M.G, Kale C.M, Patki S. Y. (2002). Building drawing with an integrated approach to Built Environment, Tata McGraw-Hill Education.
6. Neufert, P. (2000). Architects Data. 3rd Ed. UK: Blackwell Wiley.
7. Ching, F.D.K and Juroszek, S.P (1998). Design Drawing. New York: Van Nostrand Reinhold.

BUILDING MATERIALS & CONSTRUCTION TECHNOLOGY – IV			
Course Code	BAP 204	Credits	6
Contact Hours (Hrs/Week)	6	Semester	04
Course Category	BSAE		

INTRODUCTION

This course is designed to sensitise students about cement concrete as a building material with a focus on its responsible use. The course further builds an understanding about the spanning and distribution systems in building construction like slabs, beams, columns and foundations.

COURSE OBJECTIVES

- To familiarize students with cement concrete, its manufacturing process, the advantages and disadvantages and its properties
- To make students understand how spaces can be spanned using slabs, beams etc, for flat roof constructions.
- To make students understand how building loads are distributed in frame structures using columns and foundations

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Properties and behavior of cement concrete building materials
- Designing and construction of spanning structures like concrete slabs, coffer slabs, beams
- Designing and construction of distribution structures like columns and foundations etc
- Responsible application of available construction technology

PEDAGOGY

Classroom teaching is supported with preparation of drawings and site visits.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	6	--	--	--	50	--	--	-	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Reinforced Concrete Cement as a building material <ul style="list-style-type: none"> • Introduction to Reinforced Cement Concrete, Cement, Aggregate, Water and Reinforcement. • Preparation of concrete mix, formwork, placement, curing, applications, advantages, disadvantages, construction method, problems and remedies. 	12

	<ul style="list-style-type: none"> • Water cement ratio, Curing of concrete Admixtures • Ferro cement; its properties, usage, advantages and disadvantages. 	
2.	Temporary Construction and equipments <ul style="list-style-type: none"> • Centering, shuttering and scaffolding – types, criteria of selection, advantages and disadvantages. • Tools and equipments: Electric hand tools, Vibrators, Pumps, Compactors/Rollers. Earth Moving & Excavation – Dozers, Scrapers, Graders, Shovels, Backactor, Dragline, Trenchers. • Transportation – Lorries, Trucks, Dumpers, Hoist, Cranes (mobile, static, tower). Concrete mixers and pumps for ready mix concrete. • Merits/ demerits, precautions, site planning & management issues of all of the above. 	12
3.	Spanning System <ul style="list-style-type: none"> • Slab: One way slab, two way slab, and coffer slab, Filler Slab • Flat roof • Reinforced brick concrete slab • Beam: reinforcement details 	36
4.	Distribution System <ul style="list-style-type: none"> • Column: Reinforcement Detail, Column and beam joints • Foundation: shallow and deep foundation, reinforcement details 	24

REFERENCE BOOKS

1. Kumar, S.K. (2001), Building Construction, 19th Ed., Standard Publishers Distributors
2. Punamia B.C., Jain Ashok Kr., Jain Arun Kr. (2008), Building Construction, 10th Ed., Laxmi Publications Pvt Limited
3. Rangwala, S.C. (2001), Building Construction, 19 th Ed., Charotar Publishing House.
4. McKay, W.B. (2005), Building Construction, Vols. I, Longman.
5. McKay, W.B. (2005), Building Construction, Vols. II, Longman.
6. McKay, W.B. (2005), Building Construction, Vols. III, Longman.
7. Emmitt, [Stephen](#) and Gorse. (2014), Barry's Introduction to Construction of Building, 3rd Edition, Wiley-Blackwell.
8. Chudley, Roy. (2010), Building Construction Handbook, Routledge; 8 edition.

Computer Aided Design Techniques – II			
Course Code	BAP 206	Credits	2
Contact Hours (Hrs/Week)	4	Semester	04
Course Category	HMC		

INTRODUCTION

This course is designed to help students learn the application of various softwares, which are commonly used in Architectural practice.

COURSE OBJECTIVES

The objectives of the course are to:

- To familiarize students with important software's
- To enable students to improve their working with drawings and views
- To equip students with an effective 3D presentation techniques for building models

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Apply the software techniques for better design scalability and presentation
- Achieve better visualization for the design schemes
- Understand the applicability of different software's

PEDAGOGY

Classroom teaching may be supported with lectures, tutorials, study of archival material, reports, and drawings etc.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIS	ETEP
0	4	0	--	YES	--	35	--	15	-	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Auto Cad (Advanced) Understanding complex commands like xrefs, audit, flatten, overkill, Model space & Paper space etc.	10
2.	Auto Cad -3D Understanding of basic commands for working with 3D Auto Cad- Revolve, Sweep, Loft Command, Path, Guides, etc.	10
3.	Revit (BIM) Drawing and drafting building components, making sections and elevations, exploring Revit library, importing & exporting drawings of other formats	24

4.	Sketchup Understanding drawing units, basic commands, introduction to walkthroughs, exercise on modeling, making 3D views, working with scenes	20
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REFERENCE BOOKS

1. Kirby L, Krygie E, Kim M (2017). Mastering Autodesk Revit 2018, Indianapolis, Indiana, John Wiley & Sons
2. Farrelly Lorraine, Crowson Nicola (2014). Representational Techniques for Architecture (Basics Architecture), 2nd Revised edition Bloomsbury
3. Aouad Ghassan, Wu Song, Lee Angela, Onyenobi Timothy (2014). Computer Aided Design Guide for Architecture, Engineering and Construction. New York: Routledge
4. Omura George, Benton Brian C (Jul 2014). Mastering AutoCAD 2015 and AutoCAD LT 2015, Autodesk official press.
5. Fiorello J.A (2010). CAD for Interiors beyond the Basics. Hoboken, New Jersey: John Wiley & Sons, Inc.
6. Trivedi M.C. (2009). Computer Graphics & Animation. 1st edition Jaico Publishing House
7. Groover M, (2003). Computer Aided Design and Manufacturing, 1st edition Pearson Education.
8. Grabowski Ralph (2002). The Illustrated AutoCAD 2002 Quick Reference. First Edition Cengage Learning

History of Architecture – IV			
Course Code	BAP 208	Credits	2
Contact Hours (Hrs/Week)	2	Semester	04
Course Category	DCC		

INTRODUCTION

Indigenous architecture of India assimilated the architectural vocabulary of the various cultures that it came in contact with, which resulted in development of a distinct style of architecture. In this course students will understand how architecture evolves over a period of time based on the various exchanges of ideas that happen over course of time. Students will also study, about the parallel architectural evolution happening in other parts of the world, during the similar timeline.

COURSE OBJECTIVES

- 1) To understand evolution of indigenous architecture in India due to exchange of ideas with Islamic traditions
- 2) To understand unique style and character of Islamic architecture of India, in order to appreciate how synergistic exchange of ideas leads to evolution of architectural expression.
- 3) To understand how evolving world views and other cross cultural influences impacted architecture of Renaissance period in Europe

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- 1) The evolving style and detailing in Islamic architecture in India because of amalgamation of different architectural vocabulary
- 2) The impact of local traditions and life on architectural expression and characteristics.
- 3) Various tangible and intangible factors which led to evolution of architecture in renaissance period in Europe

PEDAGOGY

Classroom teaching supported by digital media and site visit may be conducted to the site of historical importance as per syllabus.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIS	ETEP
2	0	0	YES	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	UNIT 1 Islamic architecture in India. <ul style="list-style-type: none"> • Brief Chronological introduction to dynasties in North India, Slaves Khaljis, Tughlaqs, Lodhis and Mughals. • History written in terms of “Styles” indicating dynastic and regional variations Morphologies: Functional Typologies, Mosque Tomb and Garden Pavilion Forts Palaces with examples • The Quwwat-ul-Islam Mosque: Qutab-Minar, Tughlaq - Alai Darwaza: Tomb of Ghiasud-din Tughlaq. • Gujarat – Jami Masjid in Champaner, Bijapur -GolGumbad& Ibrahim Rauza 	7
2.	UNIT 2 Mughal Period Babur and Humayun <ul style="list-style-type: none"> • Tomb gardens/pleasure gardens, Akbar – Fatehpur Sikri, Shahjahan – TajMahal (Agra), Jami Masjid (Delhi) • Exchanges between Islamic Traditions and Local building practices like Rajasthan, Deccan, Bengal • The Riparian Ghat structures of North and Central India 	7
3.	UNIT 3 Early Renaissance <ul style="list-style-type: none"> • Early Renaissance in Europe: Advent of Renaissance in Europe and impact on Architecture. • Early to High Renaissance, St. Maria Del Fiore (Florence) • Late Mughal, Lucknow Nawabi and Early European/Colonial period Architecture in India. 	7
4.	UNIT 4 Late Renaissance <ul style="list-style-type: none"> • Late Renaissance in Europe. Baroque. Michelangelo, Palladio, St. Peter’s Basilica (Rome), St. Paul’s Cathedral (London). Neo-Classical Architecture. • Renaissance to Revival in England as background to British Colonial Architecture in India. 	7

TEXT BOOKS

1. Tadgell Christopher (1990). A History of Architecture in India – From the Dawn of Civilization to the End of the Raj. London. Phaidon Press Ltd.
2. Fletcher Sir Banister (1999). A History of Architecture. London (UK). Butter-worth Heinemann Ltd.
3. Kostof Spiro(2015). A History of Architecture – Settings and Rituals. N.Y. Oxford University Press.
4. Hiraskar G.K.(2018). The Great Ages of World Architecture. Delhi. Dhanpat Rai Ltd.
5. Brown Percy (2017). Indian Architecture- Buddhist and Hindu Periods. Bombay. D.B. Taraporevala and Sons Co. Pvt. Ltd.
- 6 Michell, George (2015), Late Temple Architecture of India, 15th to 19th Centuries: Continuities, Revivals, Appropriations, and Innovations (2015), Oxford University Press

Structures- IV			
Course Code	BAP 210	Credits	2
Contact Hours (Hrs/Week)	2	Semester	04
Course Category	BSAE		

INTRODUCTION

This subject will familiarize students with the structural designing of roof spanning structures like beams, frames, portals, arch, vaults and dome.

COURSE OBJECTIVES

- To understand spanning Systems (In Steel, Timber and Masonry)
- To familiarize the student with designing aspects associated with frames, portals, arch, vault and dome.
- To help students understand and analyze different typologies of beams
- To help students relate and find patterns of structural arrangements in natural elements like trees.

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand various typologies of spanning members
- Carry out structural analysis of Beams, frames, portals, arch, vault and dome
- Correlate theory with reality by increasing observation and analysis skills

PEDAGOGY

Classroom teaching may be supported by case studies, site visits, photo documentation and hands on exercises.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIS	ETEP
2	0	0	YES	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1: Beams</u> Propped cantilever, fixed beams, continuous beam, Analysis (equation of flexure and area-moment theorem and slope-deflection, Moment distribution method)	7
2.	<u>Unit 2: Design of Beams</u> Design of beams in Steel using relevant IS codes, Design of beams in Timber using relevant IS codes, Design of reinforced brick masonry using relevant IS codes	7

3.	<u>Unit 3: Frames and Portals</u> Definition, Understanding through nature and history, Analysis (Moment distribution method), Design in masonry and timber using relevant IS codes	7
4.	<u>Unit 4: Arch, Vault & Dome</u> Definition, Understanding through nature and history, Analysis, Design in masonry using relevant IS code	7

REFERENCE BOOKS

1. Subramanian, N. (2018). Design of Steel Structures, 2nd Ed., Oxford University Press
2. Mckay, W.B. (2005). Building Construction, Vols. III, Longman
3. Mckay, W.B. (2005). Building Construction, Vols. II, Longman
4. Mckay, W.B. (2005). Building Construction, Vols. I, Longman
5. Kumar, A. (1985). Stability Theory of Structures, Tata McGraw Hill Co. Ltd.
6. Punmia, B C and Jain, Ashok Kumar (2017). Theory of Structures SMTS - II, Laxmi Publications
7. Ramamrutham, S (2014). Theory of Structures, Dhanpat Rai Publications,
8. Hibbeler, R.C (2019). Structural Analysis , 10th edition, Pearson Publication

Specifications, Quantities & Estimation			
Course Code	BAP 212	Credits	2
Contact Hours (Hrs/Week)	2	Semester	04
Course Category	DCC		

INTRODUCTION

It is imperative that students of architecture learn the art of evolving and writing detailed specifications for both standard and non standard item of works. Specifications are tools of technical communication to the construction team, which ensures quality and sustainability of construction process. Students must learn to appreciate the correlation between specifications, resource utilization and conservation, sustainable construction practices, cost effectiveness and the interconnections with issues like livelihood generation, promotion of indigenous construction techniques and materials and workmanship.

COURSE OBJECTIVES

- To equip students with the necessary technical knowledge for calculating estimates and detailed costing for small to medium scale projects.
- To equip students to develop estimates for non scheduled items of work
- To understand the interconnections of specifications with quality of construction, prevention of material wastage, promotion of tangible and intangible heritage.
- To appreciate the interconnections of specifications with other intangible issues like livelihood generation, sustainability etc

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- 1) Estimate the material quantities,
- 2) Prepare a bill of quantities,
- 3) Make specifications and draft a tender document.

PEDAGOGY

Classroom teaching may be supported by case studies, site visits, reports, photo documentation.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIS	ETEP
2	0	0	YES	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	Unit 1 Specification <ul style="list-style-type: none"> • Writing of Specification for Quantities. Items of work and Materials. 	6

	<ul style="list-style-type: none"> • Specifications for non standard item of work • Case study on inter linkage of specifications with various aspects of sustainability like material conservation, livelihood generation, promotion of indigenous and appropriate construction etc. 	
2.	Unit 2 Estimates <ul style="list-style-type: none"> • Systems-Systems of taking quantities and estimating for all trades involved in construction of medium complexity project • Classification of areas -Plinth area, Covered area, Floor area, Carpet area and Projection area. • Types of Estimates -Preliminary, Detailed. Methods of taking out quantities for building works. 	8
3.	Unit 3 Preparation of Bill of Quantities (BOQ) <ul style="list-style-type: none"> • Mode of measurements of quantities. Market rates of labour and building materials. Labour turnout and norms for consumption of basic materials. 	6
4.	Unit 4 Schedule of rates and Tenders <ul style="list-style-type: none"> • CPWD, PWD, Cost Index. Analysis of rates for common items of work like Cement concrete, Brick work, Painting etc. Methods for preparation and submission of preliminary estimates and detailed estimates. • How buildings are created : Changing role of architects in building construction, construction audits, criteria's for identifying the constructing agency for different scale of projects ensuring the minimum quality • Tender -Tender notices and tender documents. Types of tendering in practice. Process of tendering. Preparation of tender notes/ documents and comparative statements Award of Tenders 	8

TEXT BOOKS

1. Dutta B.N., Estimating and Costing in Civil Engineering, UBS Publishers Distributors Pvt Ltd, New Delhi, 2003.
2. Kohli, D.D and Kohli, R.C., "A Text Book of Estimating and Costing (Civil)", S.Chand & Company Ltd., 2004
2. Delhi Schedule of Rates, PWD Publications

Building Services-II: Illumination & Electrical Design			
Course Code	BAP 214	Credits	2
Contact Hours (Hrs/Week)	2	Semester	04
Course Category	BSAE		

INTRODUCTION

Proper illumination and electrical design is imperative for functional efficiency of any building. It is very important to design the illumination and electrical systems in an efficient manner in order to conserve energy, enhance the quality of spaces inside the building and at the same time make the space efficient in usage.

COURSE OBJECTIVES

- 1) To develop understanding about the science of lighting and electrical systems
- 2) To equip students with knowledge about the schematic layout of simple illumination and electrical systems for buildings.
- 3) To sensitize students towards energy conserving electrical system design and detailing

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- 1) Design lighting systems and provide optimum lighting inside a building
- 2) Perform basic lighting measurements/calculations.
- 3) Understand and plan for electrical services and installations inside a building

PEDAGOGY

Classroom teaching supported by digital media. Site visit may also be conducted to understand the electrical layouts, services, installations and illumination design

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIS	ETEP
2	0	0	YES	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	UNIT 1 Illumination Design <ul style="list-style-type: none"> • Photometry, Transmission of light, Glare, Daylight illuminance and its unit of measurement, recommended illuminances, Luminance and its unit of measurement, Glare, Luminance distribution, Luminous flux and unit of measurement, Daylight factor, Basic Elements of National Lighting Code 2010, Requirement of Artificial Lighting. 	7

	<ul style="list-style-type: none"> •Comparative Lighting systems efficiency through units of Lumens / watt, Lighting Power Density. 	
2.	UNIT 2 Electrical Services <ul style="list-style-type: none"> • Circuits- series and parallel. • Wires- specifications and carrying capacity and calculation of electrical loads. • Types of switches, sockets and fixtures. • Distribution boards, circuit breakers, fuses, electrical meters, Low Side and high side panels, transformers, DG sets, Substations and their Sizes/ layout • Power factor correction devices 	7
3.	Unit 3 Electrical Installations <ul style="list-style-type: none"> • Design considerations for electrical installations. • Protection against overload, short circuit, earth fault, lightening Conductors and other safety measures for buildings. • Wiring systems- methods of wiring, joint and loop in. • Types of electrical wiring- batten, capping & casing, concealed conduits etc. • Wiring material- types, sizes and specifications, main switch, MCB, DB meter. • Tests before commissioning of electrical services. 	7
4.	UNIT 4 Energy Efficient designs <ul style="list-style-type: none"> • Solar Photovoltaic Energy and its applications for lighting, pumping etc. • Energy Efficient Appliances & BEE Ratings • Power Density / Energy Performance index for various building types and for energy efficient buildings and BEE Ratings for the same. • Concept of Net Zero Building 	7

REFERENCE BOOKS

1. Joseph De Chiara, Time Savers Standards for Interior Design & Space Planning ,Mcgraw Hill Education, 2001
2. National Lighting Code 2010 - BIS
3. Salvan, George S., Architectural Utilities 3: Lighting & Acoustics, JMC Press INC, Quezon City, 1999 (Revised Edition)
4. Sage, Russell. The Architecture of Light: Architectural Lighting Design Concepts & Techniques, Conceptnine, 2012
5. National Building Code 2016 – Bureau of Indian Standards

Art & Design Appreciation			
Course Code	BAP 216	Credits	2
Contact Hours (Hrs/Week)	2	Semester	04
Course Category	DEC		

INTRODUCTION

Understanding architecture as a socio-cultural product with linkages to natural environment. Introduction to the meaning, context, and significance of the elements and outcomes of designs in graphics, textiles, ceramics, sculpture, painting and printing as related to architecture. Improvising the ability to understand, interpret and evaluate visual message. In this course introduction to the vocabulary of art and architecture constituted by elements and principles shall be undertaken in detail.

COURSE OBJECTIVES

- Disseminate the understanding of social and cultural movements that shaped art and design of the past monuments and moments; memory and identity.
- Critically analyse different art and architectural works and be able to understand the purpose and function of criticism.

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Analyse the development of Indian and European art and culture for the periods covered.
- Identify different styles of regional and/or periodical art forms.
- Analyse the contributing factors for the development of different styles of art. Appreciate the painting and sculptural art objects of different region.
- Interpret art works by analysing their components' characteristics.

PEDAGOGY

Critical engagements with various artist's work and creative expressions of issues; constituting the activity of discovering, inventing, and delivering arguments. Field visits to places of various art and architecture forms and critical appreciation assignments through writing and presentation. Case study of select artist and architecture work.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	2	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Introduction: Defining the disciplinary differences Introduction to various types of Art, Concept of beauty and Aesthetics. Evolution of art and design	6
2.	Art and Design: A historical perspective History of Art. Art through ages. Importance of Visual perception, Design elements from nature. Visual	6

	Literacy: Introduction to the meaning, context, and significance of the elements and outcomes of designs in graphics, textiles, ceramics, sculpture, painting and printing as related to Architecture. Understanding the relevance of symbols and images in architecture	
3.	<u>Expression of Art and Design</u> Relationship between Art and Design with man, space and environment. Concept of space. Articulation of form, sense of enclosure, Organisation of spaces. Review of selected examples Mughal Art Forms –Miniature Art forms during Akbar and Jehangir , Indian Miniature Schools – (a) Pahadi Schools and (b) Rajasthani Schools ,Architectural Art Form during Shah Jahan Salient Modern Art Forms of Europe since Industrial Revolution Art Nouveau, Cubism, Suprematism, De Stijl, Impressionism, Expressionism, Mondrian art etc.	10
4.	<u>Introduction to theories</u> Golden proportion, Theories of scale and proportion, Vitruvian theory, Modular man, principles of Design and elements of Architecture. Relations in Art, Design and Architecture Factors influencing the process of Art, Design and Architecture. Form and function.	6

REFERENCE BOOKS

1. Cantanese, A. J. and Snyder, J. C. (1988). Introduction to Architecture. New York: McGraw hill Books Co.
2. Ching, F. D. K., Jarzombek, M. and Prakash, V. (2010). A Global History of Architecture. 2nd Ed. John Wiley & Sons.
3. Fred, S. K. (2009). Art through the ages a Global History. 3rd Ed. Clark Baxter.
4. Heidegger, M. (1993). The origin of the work of Art-Basic writings. Harper Collins.
5. Heskett, J. (2002). Design-A very short introduction. Oxford University Press.
6. Rapoport, A. (1969). House Form and Culture. New Jersey : Prentice Hall.
7. Salingaros, N. (2009). A Theory of Architecture. Umbau-Verlag.
8. Vitruvius, Translation: Morris, H. M. (1960). The Ten Books on Architecture.

Art in Architecture			
Course Code	BAP 218	Credits	2
Contact Hours (Hrs/Week)	2	Semester	04
Course Category	DEC		

INTRODUCTION

The course will help gain deep understanding of the social and cultural movements that shaped architecture of the past monuments and moments; memory and identity. Understanding of architecture as a socio-cultural product with linkages to natural environment. Introduction to the meaning, context, and significance of the elements and outcomes of designs in graphics, textiles, ceramics, sculpture, painting and printing as related to architecture.

COURSE OBJECTIVES

- To enable flowering of aesthetic sensibilities and a realization of the appeal of physical form.
- To help students identify and appreciate Architecture as an outcome of social and cultural processes of a geographical locality.
- To promote the visual literacy level and prepare to appreciate the aesthetic components of art and architecture.
- To analyse architectural grammar, styles and practices in various cultural settings

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand and :

- Explain visual meanings and understand the relationship of art and architecture.
- Critically analyze different art and architectural works.
- Explore the purpose and function of criticism.

PEDAGOGY

Students will be familiarized with all forms of arts through continual exposure to creative works through presentations, film shows, seminars, workshops, symposia, exhibitions etc., in which students can participate in interest-based groups, across class and sectional divisions, on and off campus under tutorial guidance.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	2	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Introduction to various types of Art, Concept of beauty and Aesthetics. Evolution of art and design. Relationship between Art and Design with man, space and environment.	4
2.	Golden proportion, Theories of scale and proportion, Vitruvian theory,	2

	Modular man, principles of Design and elements of Architecture.	
3.	<p>Factors influencing the process of Art, Design and Architecture. Form and function. Study of select examples from below:</p> <ul style="list-style-type: none"> • Temple Art forms in India (General Characteristics with few illustrative examples to be discussed) • Khajuraho Complex (Madhya Pradesh), Modhera (Gujarat), Mount Abu (Rajasthan), Sun Temple Konark; Bengal Terracotta Temples at Bishnupur, Mahabalipuram Shore Temple. <p>Art Forms of Europe during Renaissance, Pre-Renaissance art form in Church and Palaces / Forts of Europe, Different Stages of Renaissance in Europe and their general characteristics:</p> <ol style="list-style-type: none"> Early Renaissance Mature Renaissance Late Renaissance – Baroque and Rococo. 	11
4.	<p>Mandatory discussions/lectures/seminars about/ on the philosophy/ideas of below mentioned authors/persons:</p> <p>Vitruvius Pollio (De architectura: treatise on Architecture), Louis Sullivan (Form Follows Function), Le Corbusier (Towards a new Architecture), Michel Foucault (ideas on Power, Knowledge, Aesthetics, Method, Epistemology), Merleau-Ponty (perception & Art; Phenomenology, Post/Structuralism), Martin Heidegger (The Origin of the Work of Art, existential phenomenology), Juhani Pallasmaa (Architecture & the senses).</p>	11

REFERENCE BOOKS

1. Cantanese, A. J. and Snyder, J. C. (1988). Introduction to Architecture. New York : McGraw hill Books Co.
2. Ching, F. D. K., Jarzombek, M. and Prakash, V. (2010). A Global History of Architecture. 2nd Ed. John Wiley & Sons.
3. Fred, S. K. (2009). Art through the ages a Global History. 3rd Ed. Clark Baxter.
4. Heidegger, M. (1993). The origin of the work of Art-Basic writings. Harper Collins.
5. Heskett, J. (2002). Design-A very short introduction. Oxford University Press.
6. Rapoport, A. (1969). House Form and Culture. New Jersey : Prentice Hall.
7. Salinger, N. (2009). A Theory of Architecture. Umbau-Verlag.
8. Vitruvius, Translation: Morris, H. M. (1960). The Ten Books on Architecture.

Graphic and Product Design			
Course Code	BAP 220	Credits	2
Contact Hours (Hrs/Week)	2	Semester	04
Course Category	DEC		

INTRODUCTION

Graphic and Product design, on a smaller scale, seeks to blend the technical with the aesthetic, the utilitarian with the emotional delight; the dialogue between what people need / want vs what people will buy / discard.

COURSE OBJECTIVES

- Understand and appreciate the relationship between Design, Technology and Product..
- Understand and gain exposure to emerging areas of design.
- Understand the relevance of design in the context of India and explore Indian Aesthetics.

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Techniques and tools to improve the quality of human environment with products that are functional and aesthetic.
- Find creative solutions by correlating technical and ergonomic aspects with human needs.
- Understand the product design process: from idea generation to commercialization; concept, development, detail; materiality, technicality, imageability.

PEDAGOGY

Short projects along with a time problem will be tackled in the class exploring the influences of design process, and ergonomics on the product ideation and development. The student will also study the product changes that will occur through the choices made of materials, manufacturing process, and marketing techniques. Discussions, video presentations, seminars and case studies will cover various topics and undertake Chronological studies for analysis of designed objects/systems/environments and their eclectic evolution through technology change.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	2	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Design Definitions and Design Spectrum .Product Attributes – Function and Emotion. Product Analysis – Diachronic, Synchronic. History of product design as a discipline, the various theories of design via study of design practices. Role of Design in creating the future	4

2.	Impact of culture i.e. the aesthetics on product ideation and development, the dialogue between peoples aspirations and people's needs. Relationship and difference between craft based and mass manufactured products. Indian aesthetic sense and its influence on product ideation and development. Case studies in Product and Communication Designs.	4
3.	Introduction to Graphic design – elements principles and their applications. Paper sizes and formats, Folding and binding. Basics of Typography, Grid systems, Identity Design. Logo design. Concepts of Product Branding. Label designs for product packaging on paper and cardboards mock-ups. Design for Print media. Introduction to Printing processes: Gravure, Screen, Offset and Digital printing. Exercises related to above topics.	8
4.	Studio Exercises: Identification and analysis of samples of good and bad design for sensitization to Design quality/processes. Simple exercises in graphic and product design creation/recreation through mock ups/montages/paste boards using primary materials such as paper, Plaster of Paris, board, wood, Plastic etc.	12

REFERENCE BOOKS

1. Norman, Donald A. (2002). The Design of Everyday Things, Publisher: Basic Books; 1st Basic edition,.
2. Gross, Clifford M. (1996). The Right Fit: The Power of Ergonomics As a Competitive strategy, Publisher: Productivity Press Inc, Powell, Dick; Design Rendering Techniques: A Guide to Drawing and Presenting Design Ideas, Publisher: North Light Books
3. Buxton, Bill (2007). Sketching User Experiences: Getting the Design Right and the Right Design (Interactive Technologies), Morgan Kaufmann
4. Ashby M., Johnson K. (2002). Materials and Design: The Art and Science of Material Selection in Product Design: Butterworth-Heinemann; 1st edition
5. Rouse, William B. (1991). Design for Success: A Human- Centered Approach to Designing Successful Products and Systems, Publisher: Wiley-Interscience;
6. Byers, Mel(1994).The Design Encyclopedia, Publisher: John Wiley & Sons Publications
7. Buchanan, Richard; Margolin, Victor(1995). Discovering Design : Explorations in Design Studies, University of Chicago Press
8. Papanek, Victor(1985). Design for the Real World: Human Ecology and Social Change, Publisher: Academy Chicago Publishers; 2nd Rev edition,
9. B. Gordon and M. Gordon (2002).Complete Guide to Digital Graphic Design, Thames and Hudson,
10. P. B. Meggs(1992). *Type and Image:The Language of Graphic Design*, VNR
11. R. Carter and P. B. Meggs(2000). *Typographic Design: Form and Communication*, John Wiley and Sons.

Detailed Course Curriculum/Scheme of Examination-Semester V
Bachelor of Architecture, IGDTUW

<u>THIRD YEAR</u>					
Fifth Semester					
S.No.	Code	Subject	(L-S-P)	Credit	Category
1	BAP 301	Architectural Design - V	0-10-0	10	DCC
2	BAP 303	Building Materials & Construction Technology – V	0-6-0	6	BSAE
3	BAP 305	Sociology and Psychology in Architecture	2-0-0	2	HMC
4	BAP 307	History of Architecture- V	2-0-0	2	DCC
5	BAP 309	Structures - V	2-0-0	2	BSAE
6	BAP 311	Building Services-III: HVAC	2-0-0	2	BSAE
7	BAP 313	Research Methodology	0-0-2	1	HMC
8	BAP 315	Sustainable Development	0-0-4	2	DEC
	BAP 317	Architectural Conservation			
	BAP 319	Architectural Journalism			
	*	Any Other Elective (s)			
9	GEC 301	Generic Open Elective	0-0-4 / 2-0-0 / 0-2-0	2	GEC
			Total	29	

- Departmental Core Courses (DCC)
- Humanities, Social Sciences, Management and Skill/Entrepreneurship Development Courses (HMC)
- Basic and Applied Science Courses (BSAE)
- Departmental Elective Courses (DEC)
- Generic Open Elective Courses (GEC)

Generic Open Elective Courses (GEC) course to be taken up as per departmental guidelines.

ARCHITECTURAL DESIGN-V			
Course Code	BAP 301	Credits	10
Contact Hours (Hrs/Week)	10	Semester	05
Course Category	DCC		

INTRODUCTION

There is a need to observe inclusion of people belonging to diverse social groups through architectural design and the course focuses on sensitizing the students towards the same. The course should aim to develop sensitivity towards social inclusion in architecture which takes into account the diverse needs of people of different ages, abilities, socio-cultural context etc.

COURSE OBJECTIVES

- To develop understanding about building bye laws.
- To sensitize students towards resource conservation through the design process.
- To develop understanding on how needs and aspirations of diverse user groups will impact the architectural manifestation of the built environment.

PREREQUISITE

The student should have a basic understanding of the physical environment surrounding her.

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Design an institutional project considering the statutory provisions and societal issues in the given context.
- Understand sensitive and responsive design from the perspective of one or more aspects/issues pertaining to social inclusion.

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, case studies, site visits (local/outstation), surveys, studio discussions, model / 3D making, sketching/drawing, hands-on activities, projects/ presentations/videos and Internal Juries. Faculty members strive to make the classes interactive so that students can correlate the theories and apply them to produce innovative architectural designs. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	10	--	--	--	50	--	--	-	--	50

CONTENT

S. No	Contents	Contact Hours
1.	<p>Theme Based Studio</p> <p>The studio may be theme based, exploring social inclusion through architecture for people across the cross section of society. User group/s for addressing the theme/s could be architecture paradigms for aged and aging, architecture of care, child friendly architecture, social inclusion and architecture, gender sensitive architecture, universal access & barrier free architecture – experience, quality and access, architecture for poor, etc.</p> <p>Site Analysis: Climatic consideration for the design, orientation of building on site their application in elevations as functional/aesthetic solutions will be a part of the design exercise.</p> <p>Contextual Understanding: Study of the context and elements of built and unbuilt spaces in an observable setting to develop the understanding of socio-cultural attributes of the physical environment, methods of construction emerging out of the way of life of the people in a given place including topographical and climatic survey.</p>	40
2.	<p>Design Problem</p> <p>Suggestive projects may be Institutional Buildings like Museums, Hospital, Library, educational Institute, NGO institute, etc. up to 5000 square meters. The design activity may also include as below (but may not be restricted to only these):</p> <ul style="list-style-type: none"> • Study of site context, users, building resources, building systems, building services etc. • Case study – National or International • Designing of service cores/ services in the project. • The design may also explore/address conditions arising if the building is to operate nocturnally. • Students may be encouraged to demonstrate the theme adopted for design studio through any one mode, for example through report, estimation, simulations for passive climatic control, drawing, etc., apart from regular design submission. <p>1 Major, 1 Minor and 1 time problem may be done in the semester.</p>	100

REFERENCE BOOKS

1. Rasmusson, S.E., "Experiencing Architecture", Chapman and Hall Ltd., 1964.
2. Licklidan, H., "Architectural Scale", The Architectural Press, 1966
3. Smith, P.F., "Architecture and the Human Dimensions", George Baldwin Ltd., 1979
4. Ching. F.D.K., "A Visual Dictionary of Architecture", Van Nostrand Reinhold, 1997
5. Ching. F.D.K., "Architecture Theoretician", Wiley, 2007
6. Fisher, T., "Architectural Design and Ethics: Tools for Survival", Architectural Press, 2008.

BUILDING MATERIALS & CONSTRUCTION TECHNOLOGY- V			
Course Code	BAP 303	Credits	06
Contact Hours (Hrs/Week)	06	Semester	05
Course Category	BSAE		

INTRODUCTION

This subject gives insights about finishing materials, cost effective construction materials & techniques and speedy construction technology

COURSE OBJECTIVES

- To develop understanding of surface finishes, their properties, uses, construction techniques, and application in building.
- To equip students with speedy construction techniques
- To sensitize students with cost effective structures like bamboo reinforcement, ferrocement etc

PREREQUISITE:

The student should have a basic understanding of conventional construction techniques.

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Co-relate properties of various surface finishing materials with project requirements.
- Understand the technical drawings used for speedy construction techniques.
- Learn the application of various fast pace and modular construction systems
- Explore different cost effective construction systems.

PEDAGOGY

The teaching-learning of the course would be organized through case studies, site visits (local/outstation), surveys, studio discussions, model / 3D making, sketching/drawing, lectures, assignments, projects/ presentations/videos, hands-on activities and Internal Juries. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted.

EVALUATION SCHEME

COURSE TYPE			EXAMINATION		RELATIVE WEIGHTS						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	6	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Building Material <ul style="list-style-type: none"> • Paints and surface finishes: Composition, properties and methods of application of different types of paints: Oil, synthetic enamels, acrylic and other plastic emulsions and formulations, interior and exterior grade paints. Cement based paints. Commonly used cladding materials (like tiles, ACP, GRC, etc.) • Cost effective building materials- bamboo, ferrocement etc , 	24
2.	Speedy Construction Techniques <ul style="list-style-type: none"> • Speedy Construction Techniques: Introduction to Pre-stressing, Post Tensioning and Pre Tensioning, Prefabrication, Lift Slab Techniques, Tilt up Construction, Precast Construction – Column Beam Joints, Staircase, Roof, Walling. 	24
3.	Cost Effective Building structures: <ul style="list-style-type: none"> • Bamboo Structures, Bamboo reinforced concrete, Structures like ferrocement channels, plank and joist. • Brick Roof: Domes, Reinforced Brick Concrete, Filler Slab. 	36
4.	Regular site visits shall be encouraged for practical learning and students shall maintain a sketch book for their site visits	

REFERENCE BOOKS

1. Kumar, S.K., "Building Construction", 19th Ed., Standard Publishers Distributors, 2001
2. Rangwala, S.C., "Building Construction", 19 th Ed., Charotar Publishing House. 2001
3. McKay, W.B., Building Construction, Vols. I, Longman. 2005
4. McKay, W.B., Building Construction, Vols. II, Longman. 2005
5. McKay, W.B., Building Construction, Vols. III, Longman. 2005
6. Stulz, Roland and Mukherjee, Kiran, "Appropriate Building Materials" SKAT, 1993.
7. Emmitt, Stephen and Gorse, "Barry's Introduction to Construction of Building", 3rd Edition, Wiley-Blackwell, 2014.
8. Barry, Robbin, "The construction of Buildings", Vol. 1 to 5, Blackwell Science, 1996.
9. Chudley, Roy, "Building Construction Handbook", Routledge; 8 edition, 2010.

Sociology and Psychology in Architecture			
Course Code	BAP 305	Credits	02
Contact Hours (Hrs/Week)	02	Semester	05
Course Category	HMC		

INTRODUCTION

The course develops an understanding of the interrelationship between the social and psychological behaviour of people and the built environment.

COURSE OBJECTIVES

- To sensitize students about the impact of architecture on human behaviour
- To explore design as a product of various inter-woven micro and macro level social issues.

PREREQUISITE

None

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand the correlation between social, economic, and political issues and their impact on built environment
- Understand the inter-relationship between built environment and human psychology.

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, site visits, surveys, audits, projects/ presentations/videos and quizzes. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples for better understanding. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	Unit 1 Sociology What is a society , What is sociology and why is it required to study it, Globalization, Social interaction and everyday life, Family Structure: The Environment, families and relationships, Rural and urban life and social structure, Social Communication	07

2.	<u>Unit 2 Systems in Society</u> General understanding of systems like health, Education, Gender, Migration, Social Stratification, Religion, Media, Crime, Economics, Politics, War, Organizations, Institutions and Networks and their impact on the built environment.	07
3.	<u>Unit 3 Introduction to Psychology</u> Nature and scope of psychology; maturation and development; biological bases of behaviour.	07
4.	<u>Unit 4 Social Audit</u> Social survey and Social research –principles of social research. Scope of research, units of study, choice of research topics, sources of information, identifying a public place and conducting a social audit of the place from the perspective of an architect.	07

REFERENCE BOOKS

1. Elgin F. Hunt, David C. Colander "Social Science - An introduction to the Study of Society", Pub. Macmillan Publishing Company, New York 1984.
2. Giddens, Anthony, "Sociology", Pub. Polity Press in association with Blackwell Publishers, 1989
3. J. Douglas Porteous, "Environment and Behavior - Planning and Everyday Urban Life", Pub. Addison Wesley Publishing Co, Branding, Massachusetts, 1977.

History of Architecture – V			
Course Code	BAP 307	Credits	02
Contact Hours (Hrs/Week)	02	Semester	05
Course Category	DCC		

INTRODUCTION

The modern period of architecture is characterised by development of many new schools of thoughts and innovations in building design and detailing. The course will help in making students aware of this era of architectural history and its impact on international architectural vocabulary.

COURSE OBJECTIVES

- To study social changes and its impact on architecture.
- To understand the background, development, concept, and practice of modern architecture.
- To understand the work of the great masters of the modern period.
- To understand new materials and techniques that were introduced during the period, and its impact on architecture.

PREREQUISITE

Students should have basic Knowledge of how architecture evolved over centuries in India during ancient, Buddhist, Medieval and Islamic periods. Students should also be aware of architectural development in the rest of the world till the advent of the modern period.

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand the evolution & impacts of various architectural movements in the world and their role in defining modern architecture
- Understand how social, economic, political and technical changes influence architecture.

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, site visits, sketching/drawing, projects/ presentations/videos and quizzes. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples for better understanding. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1 Various Movements in Architecture</u> Modernity, modernization, modernism, culture, territorial and technical transformations behind the advent of modern architecture, cultural transformation and revolutionary visionary architects of the time. The social, economic and political impacts of the Industrial Revolution in Europe, affecting new requirements of society, materials and technological developments.	07
2.	<u>Unit 2 New Materials</u> New Materials, Concrete, Iron & Steel and Glass (Eiffels, Hennebique Auguste Perret, Malliart) The Chicago School, Skyscrapers (Louis Sullivan-form follows function, Adler), Organic Architecture (F L Wright- "form and function are one" eg. Falling Water, Prairie style)	07
3.	<u>Unit 3 Art and Craft Movements</u> Art and Craft movement (Augustus Pugin, William Morris). Structure Rationalism (Eugene Viollet le Duc). Art Nouveau (Casa Mila- Antonio Gaudi), Art deco (Chrysler Building by William Van Alen), Pavillon de l'Esprit Nouveau (Le Corbusier). Bauhaus (Walter Gropius). De Stijl movement (Mies van der Rohe, Rietveld Schröder House). Modern concept of space, spatial compositions, abstract masses- Alvar Alto, Louis I Kahn (House of Culture, IIM, Ahmedabad, Jatiyo Sangshad Bhavan). Brief introduction to be also given to the students about other important movements like Futurism, Cubism, Purism, Constructivism, Surrealism, Dadaism, Pluralism etc.	07
4.	<u>Unit 4 Ideas and works of great masters</u> F L Wright, Le Corbusier. Oscar Neimeiyer. (Johnson Wax Headquarters, Guggenheim, Villa Savoye, Chapelle of Notre-Dame-du-Haut in Ronchamp, High Court of Justice, Chandigarh, Secretariat Building, Chandigarh, Palace of AsSemesterbly , Chandigarh, Cathedral of Brasília), Deconstructivism (Frank Gehry - Guggenheim at Bilbao, Rem Koolhaas – Seattle Central Library, Kenzo Tange, Zaha Hadid - Contemporary Arts Center, Cincinnati, Ohio)	07

REFERENCE BOOKS

1. Moffet, M., Fazio, M. and Wodehouse, L., "A World History of Architecture", McGraw-Hill, 2008.
2. Fletcher, B., "A History of Architecture", 20th Ed., Butterworth Heinemann, 1996
3. David Smith Capon, John Wiley & Sons, "Architectural Theory, Vol 2, Principles of Twentieth Century Architectural Theory", Chichester, England 2000, (pp.i-xii, 1- 140).
4. Ching, Francis D K, "Architecture - Form, Space and Order", Van Notstrand Reinhold, New York. 1996 (For Graphics).
5. Frampton Kenneth, "Modern Architecture: A Critical History", Thames and Hudson. 1985

Structures-V			
Course Code	BAP 309	Credits	02
Contact Hours (Hrs/Week)	02	Semester	05
Course Category	BSAE		

INTRODUCTION

This subject gives insights about structural behaviour and designing of spanning systems and staircase with Reinforced Concrete Cement.

COURSE OBJECTIVES

- To develop understanding of external forces and internal reaction forces of spanning system
- To develop skill of designing of spanning system and staircase using Reinforced Concrete Cement

PREREQUISITE

Basic understanding of load bearing structures and frame structures.

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand behaviour of spanning systems in Reinforced Concrete Cement structure.
- Analyse and understand the design of building components constructed in Reinforced Concrete Cement
- Learn the application of different spanning systems in building.

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, site visit, projects/ presentations/videos and quizzes. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples for better understanding. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1 Design methods</u> Introduction to various methods used in Reinforced Concrete Cement analysis design e.g. working stress method, limit state method etc. Understanding of limit state, characteristic strength and characteristic load, partial safety factors, factored loads, Stress Strain relationship for concrete & steel, Yield Stress, load & load combination.	07

2.	<u>Unit 2 Beam analysis</u> Introduction, bending of beam assumption, modes of failure. Maximum depth of neutral axis, moment of resistance of singly reinforced beam, doubly reinforced beam, and flanged beams in Reinforced Concrete Cement using relevant IS codes by working stress method and limit state method	07
3.	<u>Unit 3 Beam design</u> Introduction to design of singly reinforced beam and doubly reinforced beam in Reinforced Concrete Cement using relevant IS codes by working stress method and limit state method.	07
4.	<u>Unit 4 Slab and Staircase (Limit State Method)</u> Introduction to design of one way slab and two way slab in Reinforced Concrete Cement using relevant IS codes. Introduction, types of staircase, design of staircase in Reinforced Concrete Cement using relevant IS codes. Introduction to design of filler slab	07

REFERENCE BOOKS

1. Dr. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, "Reinforced concrete cement Designs (Reinforced Concrete Structures)", Tenth edition, 2006.
2. S.K.Mallick and A.P.Gupta, "Reinforced Concrete, 6th Edition", Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi, 1996.
3. Dr. Ramchandra and Virendra Gehlot, "Limit State Design of Concrete Structures", Scientific Publishers, 2007.
4. Dr. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi; "Comprehensive RCC Design", Tenth edition, 2006.

Building Services-III: HVAC			
Course Code	BAP 311	Credits	02
Contact Hours (Hrs/Week)	02	Semester	05
Course Category	BSAE		

INTRODUCTION

Heating, cooling and ventilation are integral parts of any building project and have an impact on thermal comfort of users. The course focuses on understanding of efficient planning and design of heating, cooling and ventilation systems in the building.

COURSE OBJECTIVES

- To understand the schematic layout of simple air conditioning system
- To sensitize students towards various energy efficient envelope design
- To equip students with energy efficient air conditioning systems and technology

PREREQUISITE

Students should be aware of basic fundamentals of climatology

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand various HVAC systems and its design.
- Appropriately apply the knowledge of energy efficient air conditioning requirements.
- Promote use of passive architecture techniques

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, case studies, site visits, projects/ presentations/videos and quizzes. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples for better understanding. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	Unit 1 Envelope Design for air conditioning Introduction, fundamental of psychometric chart and means of heat transfer, physiological effects of air conditioning. Features of Air-conditioning vis-à-vis air cooling. Climate and Requirement of Space Conditioning. Concepts of Adaptive	07

	Comfort based Design. Envelope Design of Buildings and its various components including walling system including insulation / roofing system including insulation / fenestration design including efficient glazing systems. Limiting Window-to-wall ratio and appropriate shading	
2.	<u>Unit 2 HVAC system</u> Air conditioning methods, type and equipment to maintain the atmosphere at required temperature, humidity & cleanliness. Means of mechanical ventilation, types of AC's, Blowers and exhaust fans like propeller fan & centrifugal fans system. Relationship of mechanical ventilation system to fire and smoke control.	07
3.	<u>Unit 3 HVAC designing techniques</u> Component of HVAC system, designing, detailing, layout, and space requirements. HVAC Plant Room and AHU Design and Planning. Duct planning and incorporation with other services.	07
4.	<u>Unit 4 Energy Efficient air conditioning Design</u> Energy efficient air conditioning systems and technologies. Indoor Air Quality Control, usage of energy simulation software for HVAC systems, say Design Builder. Active and Passive radiant cooling mechanism, direct and indirect evaporative cooling systems, Air/ water/Ground based cooling systems, Vapour Absorption systems (VAM), Solar based air conditioning, Demand based ventilation.	07

REFERENCE BOOKS

1. Majumdar, Mili, "Energy efficient Buildings in India", TERI 2001.
2. Manual on Solar Passive Architecture by IIT Bombay, 1999.

Research Methodology			
Course Code	BAP 313	Credits	01
Contact Hours (Hrs/Week)	02	Semester	05
Course Category	HMC		

INTRODUCTION

Knowledge of architectural research is essential for making informed decisions about architectural processes, design and detailing. It can also help to sharpen the critical thinking and evaluation skills of students.

COURSE OBJECTIVES

- To increase the student's abilities to conduct architecture research.
- To develop the skills of students to interpret and evaluate architectural research.

PREREQUISITE

None

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Learn the skill of framing research questions
- Develop the understanding of designing a simple research, including unit of analysis, sampling, selection of data collection method and development of instruments of research
- Develop the skill of writing the research reports and abstracts.

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, case studies, surveys, class discussions, projects/ presentations/videos and quizzes. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples for better understanding. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted.

EVALUATION SCHEME

COURSE TYPE			EXAMINATION		RELATIVE WEIGHTS						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
0	2	0	--	Yes	--	35	--	15	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Introduction- the need to study research methods The nature of science- scientific vs. non scientific questions. Scientific evidence, logic and reasoning, logic of scientific reasoning- deductive and inductive reasoning in science.	07

2.	Research Design Elements of research design- selecting topics for research, units of analysis, Variables, stating problem and hypothesis, stages of research. Introduction to Measurement process- conceptualization and operationalisation of variables. Introduction to sampling- why sampling, different types of sampling, sampling design, etc.	07
3.	Methods of Data Collection Methods of data collection, introduction to validity and reliability, qualitative research, quantitative research, multiple methods research, potential and limitations of different types of research. Tools and instruments of research, introduction to design of tools and instruments, potential and limitations of different types of tools and instruments.	07
4.	Data Processing and Analysis Introduction to data processing and elementary data analysis, introduction to research ethics. Writing Research reports- Indexes and abstracts, major headings, referencing techniques etc.	07

REFERENCE BOOKS

1. C. Hawkins & M. Sorgi, "Research: How to Plan, Speak and Write about it", Springer-Verlag, 1985.
2. Rajagopalan, Mathews and Ramamurthy, "Research Methodology", Indian Institute of Technology Kanpur, 1995.
3. Linda N. Groat, David Eang, "Architectural Research Methods", Pub. Wiley, 2013.

SUSTAINABLE DEVELOPMENT			
Course Code	BAP 315	Credits	02
Contact Hours (Hrs/Week)	04	Semester	05
Course Category	DEC		

INTRODUCTION

This course on sustainable development raises awareness, about optimal resource utilization and conservation, by use of appropriate technology, informed by macro level issues like livelihood generation, social empowerment, food security, wellbeing of the ecosystem etc .

COURSE OBJECTIVES

- To sensitize students towards a holistic definition of sustainability
- To sensitize students towards the global environmental conditions and role of architecture in sustainable development of ecosystems
- To explore how to create a built environment in a sustainable manner at local level, keeping global issues in consideration.

PREREQUISITE:

Students should have basic knowledge of building materials, climatology and building construction

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand various dimensions of sustainability.
- Appreciate tangible and intangible impact of architectural processes on environment
- Develop awareness about the role of an architect in sustainable community development.

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, case studies, site visits, class discussions, debates, projects/ presentations/videos and quizzes. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples for better understanding. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted.

EVALUATION SCHEME

COURSE TYPE			EXAMINATION		RELATIVE WEIGHTS						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
0	4	0	--	Yes	--	35	--	15	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Concept of Sustainable Development <ul style="list-style-type: none"> • Sustainability and its dimensions, sustainable development, cradle to cradle design, waste conservation, resource conservation, energy conservation, embodied energy. • Understanding climate, elements constituting climate, factors affecting 	14

	climate, climate change, global warming, GHG, Brundtland Report.	
2.	International efforts for sustainable development <ul style="list-style-type: none"> • Role of UNFCC: Millennium Declarations, MDG's, 2005 World Summit, Overview of elements of Kyoto Protocol (including DOHA Amendments) and Paris Agreement, SDG's 	14
3.	Sustainable ecosystem <ul style="list-style-type: none"> • Understanding the impact of built environment on variables like livelihood, poverty, food security, gender empowerment, etc. • Identifying and working with sustainable design features like local resource and materials, local techniques/technology, site and ecology, community and culture, health, energy (including embodied energy), etc. • Understanding green building and its constituents, interrelationship between built and open environment, Concept of Environmental Impact Analysis (EIA), etc. • Cost effective building techniques, construction etc 	14
4.	Practical application of aspect of sustainability in built environment <ul style="list-style-type: none"> • Sustainability audit of a building from the aspect of sustainability and propose alternatives in design to make it sustainable through cost effective solutions. Proposals may be in form of drawings/reports/sketches etc. 	14

REFERENCE BOOKS

1. Sassi, Paola, "Strategies for Sustainable Architecture", Taylor and Francis, 2006
2. Majumdar, Mili, "Energy Efficient Buildings in India", TERI Press, 2009
3. Correa Charles, "A Place in Shade", Penguin India, 2010
4. Deulgaonkar, Atul, "Laurie Baker: Truth in Architecture", Jyotsna Prakashan, 2015

ARCHITECTURAL CONSERVATION			
Course Code	BAP 317	Credits	02
Contact Hours (Hrs/Week)	04	Semester	05
Course Category	DEC		

INTRODUCTION

This subject offers insights into the importance of establishing cultural identity and continuity in a fast evolving world. It also introduces students to the ideas of regeneration and renewing buildings, urban areas and cultural landscapes through architectural intervention.

COURSE OBJECTIVES

The objectives of the course are to:

- Develop sensitivity towards the built and unbuilt heritage including architectural heritage
- Promote sense of identity and its relevance to architecture
- Equip students with knowledge of prolonging material, structural and historical integrity of structures through planned interventions.

PREREQUISITE:

Students should have basic knowledge of evolution of architecture

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Develop enhanced understanding of the need to conserve the built and unbuilt space
- Develop awareness about the various techniques and processes involved in conservation of tangible and intangible heritage
- Develop appreciation of wisdom inherent in the traditional built environment, systems and processes.

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, case studies, site visits, class discussions, debates, projects/ presentations/videos and quizzes. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples for better understanding. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted.

EVALUATION SCHEME

COURSE TYPE			EXAMINATION		RELATIVE WEIGHTS						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
0	4	0	--	Yes	--	35	--	15	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Introduction <ul style="list-style-type: none"> • An Introduction to conservation, preservation, restoration, reconstruction and adaptation; • Understanding the objectives, principles and concepts of conservation and its application • Importance of heritage in contemporary cities; exploring the linkages between heritage & communities 	14
2.	Conservation Movements & Theory <ul style="list-style-type: none"> • History of conservation movements in the world and Indian response to the movement; Development of theory of conservation • Various charters of international importance • Values and ethics in conservation and degrees of intervention in historic buildings and monuments and why to conserve issue. 	14
3.	Causes, Remedies & Techniques <ul style="list-style-type: none"> • Causes of decay and deterioration of cultural property: external causes of decay, biological and botanical Causes, natural disasters, and man-made causes. • Inspection: The context of inspecting building-Inventory initial inspections of buildings, continued documentation, and analysis. Preparation of inspection report. • An overview of various techniques for conservation, restoration, preservation, reconstruction, and adaptation. 	14
4.	Planning, Management & Legislation <ul style="list-style-type: none"> • Concepts of historic towns, quarters and area concepts of heritage zone and concept of integrated conservation. Planning and management aspects in architectural conservation techniques for buildings and areas. • Introduction to policies, legislations, organizations, etc pertaining to architectural conservation. • Archaeological Survey of India, ASI rules such as ancient monuments and archaeological sites and remains rules 	14

REFERENCE BOOKS

1. Bernard M Feilden, "The conservation of Historic Buildings", Butterworth Architecture, Oxford, 1995.
2. Peter J Larkham, "Conservation and the City", Routledge, London & New York, 1996.
3. Graeme Aplin, "Heritage Identification, Conservation and Management", Oxford University Press, 2002.

ARCHITECTURAL JOURNALISM			
Course Code	BAP 319	Credits	02
Contact Hours (Hrs/Week)	04	Semester	05
Course Category	DEC		

INTRODUCTION

The need of making Architecture relevant for the society in which we live is most important now than ever. Referring Architecture to be a Science of Living, this subject intends to develop a critique in a student and at the same time equip the student with various trades by which this science is understood, simplified, and then shared with the society.

COURSE OBJECTIVES

- To prepare the students to develop skills of writing and commentary on architecture, design and planning
- To expose students to the current trends and modern practices in Industry and develop them as an architectural critique.

PREREQUISITE:

None

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Interpret and analyze architecture multi dimensionally
- Enhance the skills like writing skills, photography skills, documentation, etc.
- See a bigger picture while analyzing and making conclusions.
- Communicate effectively through both written and verbal modes to both technical people and laymen.

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, case studies, class discussions, debates, role plays, interviews, documentation, projects/ presentations/videos and quizzes. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples for better understanding. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted.

EVALUATION SCHEME

COURSE TYPE			EXAMINATION		RELATIVE WEIGHTS						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
0	4	0	--	Yes	--	35	--	15	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Introduction to Architectural Journalism <ul style="list-style-type: none"> What is Journalism, Architectural Journalism, Mediums of Journalism, and Role & Need of Architectural Journalism in present times, etc. Introduction to Structure of Architecture Journals; Writing Descriptive and Analytical Reports; Editing Write-ups, Photo Journalism, Book Reviews etc. 	14
2.	An Overview <ul style="list-style-type: none"> Brief history- photographs as social documentaries. Visual awareness and Visual Survey. Analysis of recent historical and contemporary examples of written and journalistic criticism of architecture, including selected writings by Indian and overseas critics; discursive techniques, analysis of major critical themes, comparison between various styles, Editing Practices, etc. Structuring the content- how to build up a case, establishing sequences, etc. 	14
3.	Learning the techniques <ul style="list-style-type: none"> Usage of language and vocabulary- introduction to methodology of writing essays, news writing, précis writing, writing in Architectural blogs, listening comprehension, analysis talks and gathering information, etc. To edit gathered information to build an article/ write up, promoting the originality of the topic. Collecting clippings from articles, blogs, books, etc. Photography- Various types- regular, advanced, amateur photography, art photography; photojournalism –an overview and approach to photojournalism; newspapers and magazine design elements, page make up; layout; colour scheme; Documentary of places; rural-urban public relations, etc. Case study of existing urban or rural set up, interpretation and analysis of the same. 	14
4.	Application of learned skills. <ul style="list-style-type: none"> This may be ascertained by giving assignments to students in the form of Debates, Radio Programmes, Panel Discussion (concluded by a report, article, publication, etc), Write-ups, documentary (video/ photo/ print), theme-based portfolios, etc. as deemed suitable for the project undertaken. 	14

REFERENCE BOOKS

1. Bender, Thomas, "Architecture and the Journalism of Ideas' Design Book Review: DBR no 15,(Fall 1988)
2. Mohd.,Al-Asad and Majd musa, ' Architectural criticism and Journalism: Global Perspectives'- Umberto Allemandi and Co., 2007

Detailed Course Curriculum/Scheme of Examination-Semester VI
Bachelor of Architecture, IGDTUW

<u>THIRD YEAR</u>					
Sixth Semester					
S.No.	Code	Subject	(L-S-P)	Credit	Category
1	BAP 302	Architectural Design-VI	0-10-0	10	DCC
2	BAP 304	Building Materials & Construction Technology – VI	0-6-0	6	BSAE
3	BAP 306	History of Architecture- VI	2-0-0	2	DCC
4	BAP 308	Structures –VI	2-0-0	2	BSAE
5	BAP 310	Building Services-IV: Acoustics, Fire Fighting & Lifts	2-0-0	2	BSAE
6	BAP 312	Settlement Design	2-0-0	2	DCC
7	BAP 314	Design Management	0-0-4	2	DEC
	BAP 316	Introduction to Healthcare Design			
	BAP 318	Architectural Model Making Techniques			
	*	Any Other Elective(s)			
8	GEC 302	Generic Open Elective	0-0-4/ 2-0-0/ 0-2-0	2	GEC
			Total	28	

- Departmental Core Courses (DCC)
- Humanities, Social Sciences, Management and Skill/Entrepreneurship Development Courses (HMC)
- Basic and Applied Science Courses (BSAE)
- Departmental Elective Courses (DEC)
- Generic Open Elective Courses (GEC)

Generic Open Elective Courses (GEC) course to be taken up as per departmental guidelines.

ARCHITECTURAL DESIGN-VI			
Course Code	BAP 302	Credits	10
Contact Hours (Hrs/Week)	10	Semester	06
Course Category	DCC		

INTRODUCTION

The studio will focus on empowering students to make informed decisions, which have a major impact on creating a sustainable built environment, through architecture. Sustainability is not merely observed in physical dimensions but is also reflected in the lifestyle of people and architecture has a major role leading towards it.

COURSE OBJECTIVES

- To develop sensitivity towards architects' role in sustainable development, this encompasses not just environmental variables, but also issues of livelihood, poverty, resource conservation etc.
- To develop understanding of appropriate building services as per context
- To develop understanding in students about their role in creating a sustainable world.

PREREQUISITE

The student should be aware of standard architectural graphical representations. She should be aware of anthropometrics, proxemics and fundamental climatology.

LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Design a project considering the statutory provisions and sustainable issues in a given context.
- Understand the constraints of a mixed use/ commercial typology in the given context, with respect to social norms, climate and client's expectations.

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, case studies, site visits (local/outstation), surveys, studio discussions, model / 3D making, sketching/drawing, hands-on activities, projects/ presentations/videos and Internal Juries. Faculty members strive to make the classes interactive so that students can correlate the theories and apply them to produce innovative architectural designs. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted.

EVALUATION SCHEME:

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	10	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Introduction Introduction to the exploration of sustainability encompassing not just environmental variables, but also issues of livelihood, poverty, migration, food security, democracy, human rights and peace. The studio may be theme based incorporating themes such as, but not restricted to, resource conservation, area optimization, solar passive architecture, strengthening local economy through architecture etc.. Introduction to the design brief. Sensitization of the concepts of sustainability in a holistic sense in the context of the unique theme of the project. Recommended projects may be commercial, mixed use etc. such as office buildings, hotels, shopping malls etc. The size of the project may be up to 7000 square meters.	15
2.	Case Study Primary and/or secondary national or international case study/studies relevant to the design problem. Study of site context, users, building resources, building systems, building services etc. The design may also explore/address conditions arising if the building is to operate nocturnally.	15
3.	Design Project Conceptual design proposal incorporating service cores/ services in the project. Design representation to be done through standardized media of drawings (site plan, plans, elevations, sections, details etc.), rendered views, model (real/ virtual) and walkthrough (optional) as per standard architectural representational systems and techniques. 1 Major, 1 Minor and 1 time problem may be done in the semester	95
4.	Project Detailing Demonstration of assimilation of various aspects incorporated in the design theme through report, estimation, simulations for passive climatic control, drawing, etc., apart from regular design portfolio submission.	15

REFERENCE BOOKS

1. Agkathidis, A., Hudert, M. and Schillig, G., "Form Defining Strategies: Experimental Architectural Design", Wasmuth, 2007
2. Relevant Master Plan and Schemes/Missions/Reports of Govt. of India/Govt of State where study area/ site is located
3. Majumdar, Mili, "Energy Efficient Buildings in India", TERI Press, 2009
4. Papanek, Victor, "Design for the real World", Academy Chicago Publishers; 2nd edition, 1985
5. Rasmussen, S.E., "Experiencing Architecture", Chapman and Hall Ltd., 1964.
6. Licklidan, H., "Architectural Scale", The Architectural Press, 1966
7. Smith, P.F., "Architecture and the Human Dimensions", George Baldwin Ltd., 1979
8. Ching. F.D.K., "A Visual Dictionary of Architecture", Van Nostrand Reinhold, 1997
9. Ching. F.D.K., "Architecture Theoretician", Wiley, 2007
10. Fisher, T., "Architectural Design and Ethics: Tools for Survival", Architectural Press, 2008.

BUILDING MATERIALS AND CONSTRUCTION TECHNOLOGY-VI			
Course Code	BAP 304	Credits	06
Contact Hours (Hrs/Week)	06	Semester	06
Course Category	BSAE		

INTRODUCTION

This subject gives insights about drawings which are prepared for actual execution of work on site. This subject makes students capable of preparing working drawings. It would familiarize the student with understanding of working drawing.

COURSE OBJECTIVES

- To familiarize students with step by step execution/ implementation on site through working drawings
- To enable the students to understand preparation of working drawings for actual construction on site.

PREREQUISITE-

Knowledge of representation of materials, dimensions, building elements on drawing. Basic understanding of construction techniques in common materials like RCC, brick, etc.

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Various constituents of a working drawing.
- Preparation of plans, sections, etc. and architectural details for buildings for execution on site.

PEDAGOGY

The teaching-learning of the course would be organized through case studies, site visits (local/outstation), studio discussions, sketching/drawing, lectures, assignments, projects/ presentations/videos, and Internal Juries. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted.

EVALUATION SCHEME:

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIP	ETES
0	0	6	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Working drawings of plans Working drawings of floor plan/s, foundation plan/s, setting/line out plan, site plan, layout plan showing different buildings, internal roads, water supply, sewage including area drainage plan.	30

2.	Working drawings of elevations & section Working drawings of elevations of all sides (front, back, and both sides) and sections: transverse, longitudinal sections, sections through staircase, elevators and sanitary units.	14
3.	Working drawing of architectural details Working drawings of architectural details, including scheduling of different finishes, doors, windows including hardware fixtures.	20
4.	Working drawing of services Preparation of roof drainage system layout, layout of sanitary plumbing lines and scheduling the fixtures in toilets and kitchens etc. Layout of electrical lines and fixtures.	20
	Regular site visits shall be encouraged for practical learning and students shall maintain a sketch book for their site visits	

REFERENCE BOOKS

1. Rasmusson, S.E., "Experience Architecture", Chapman and Hall Ltd., 1964.
2. Frank, D.K. Ching, "Drawing: A Creative Process", Van Nostrand Reinhold, 1990.
3. Frank, D.K. Ching, "Design Drawing", Van Nostrand Reinhold, 1998.
4. "DETAIL", professional journal, Detail publishers.

HISTORY OF ARCHITECTURE -VI			
Course Code	BAP 306	Credits	02
Contact Hours (Hrs/Week)	02	Semester	06
Course Category	DCC		

INTRODUCTION

India witnessed the development of distinctive architectural styles from the seventeenth century onwards. The course focuses on sensitization of students towards the genesis of architecture through this time. This course would acquaint students with the evolution of Indian architecture from late Mughal period to post Independence era.

COURSE OBJECTIVES

- To understand Indian architecture from late Mughal period and Indo Saracenic architecture.
- To understand the background, development, concept and practice of modern architecture in India.
- To acquaint the student with the various processes that have led to and the evolution of modernism in Indian architectural context.

PREREQUISITE

- Basic understanding of the constituent elements, typologies, as well as stylistic, symbolic and spatial details of Islamic Architecture in India.
- Basic understanding of the different styles of architecture prevalent in the western world.
- Basic understanding of evolution of modern architecture in the western world including the different styles of modern architecture.

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- The evolution of architecture through late Mughal empire times and Indian architecture of the post-independence period.
- The impact of social, economic and political changes on architecture

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, site visits, sketching/drawing, projects/ presentations/videos and quizzes. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples for better understanding. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted

EVALUATION SCHEME:

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	Unit 1 Late Mughal and Indo-Saracenic Architectural style Late Mughal, Lucknow Nawabi style of Architecture. Early European/ Colonial period Architecture in India – introduction to different colonial rules in India. Colonial Architecture: Portuguese (typical residence and Basilica of Bom Jesus, Goa), Dutch (typical residence/bungalow , Mattancherry Palace), French (typical villas, Basilica of Sacred Heart of Jesus, Pondicherry), Indo Saracenic architecture in India (Secretariat Building at New Delhi, Victoria Memorial at Kolkata)	07
2.	Unit 2 Modernism in India Beginning and development- J.J. School of Architecture, Indian Institute of Architects, Nationalist Architecture. Influence of the masters- Le Corbusier, Louis I Kahn. Modern Indian architects- Achyut Kanvinde (IIT Kanpur, National Science Centre, Delhi), Joseph Allen Stein (India Habitat Centre, Triveni Kala Sangam), Charles Correa (Bharat Bhawan, group housing projects, Gandhi Smarak, Jawahar Kala Kendra, Kala Academy, Goa, Cidade de Goa), B V Doshi (IIM Bangalore, NIFT Delhi, CEPT Ahmedabad, Amdavad ni Gufa), Raj Rewal (Asiad Games Village), U C Jain (Jodhpur University)	07
3.	Unit 3 Post-Independence Architecture in India Regional influence, appropriate technology, sustainability. Impact on late works of architects like Charles Correa, B V Doshi, Laurie Baker, HUDCO. In this unit importance is to be given on the design philosophies in particular.	07
4.	Unit 4 Globalization and its impact on Indian Architecture Globalization- Indian and Multi-National Companies. New typology- malls, offices, multiplex, star hotels, satellite towns (Gurgaon), the new urban residence. Introduction to rural housing, Pradhan Mantri Awas Yojana (PMAY-U, PMAY-G)	07

REFERENCE BOOKS

1. Moffet, M., Fazio, M. and Wodehouse, L., "A World History of Architecture", McGraw-Hill., 2008
2. Watkin, D., "A History of Western Architecture", Thames and Hudson., 1986
3. Fletcher, B., "A History of Architecture", 20th Ed., Butterworth Heinemann., 1996
4. Frampton Kenneth, "Modern Architecture: A Critical History", Thames and Hudson., 1985
5. Lang Jon, Desai Madhavi and Desai Miki, "Architecture and Independence", Oxford University Press, 1997.

STRUCTURES -VI			
Course Code	BAP 308	Credits	02
Contact Hours (Hrs/Week)	02	Semester	06
Course Category	BSAE		

INTRODUCTION

This subject gives insights about structural behaviour of building components used in distribution systems with Reinforced Concrete Cement. This subject also makes students capable of designing building components used in distribution systems with Reinforced Concrete Cement.

COURSE OBJECTIVES

- To develop understanding of external forces, internal reaction forces of the distribution system.
- To develop skill of designing distribution system using Reinforced Concrete Cement

PREREQUISITE

Understanding of RCC as a building material

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand behaviour of distribution system in Reinforced Concrete Cement structure.
- Analyze and understand the space and design of building components constructed in Reinforced Concrete Cement.
- Analyze the suitability of different distribution systems in building.

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, site visit, projects/ presentations/videos and quizzes. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples for better understanding. Use of ICT, web-based sources as well as flipped class room teaching will be adopted.

EVALUATION SCHEME:

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	Unit 1 Column Introduction to design of column in Reinforced Concrete Cement using relevant IS codes by limit state method	07
2.	Unit 2 Foundation Introduction, type of foundation, depth of foundation, theory and design	07

	of axially loaded isolated square footing and detailing of its reinforcement in reinforced concrete using relevant codes by limit state method	
3.	Unit 3 Retaining wall Introduction, type of retaining walls, analysis and design of cantilever retaining walls and detailing of its reinforcement using relevant codes by limit state method.	07
4.	Unit 4 Shear and development length Introduction to shear and development length in beams. Understanding of shear stress, diagonal tension, shear reinforcement, spacing of shear reinforcement, problems of shear reinforcement, development length, anchorage bond, flexural bond.	07

REFERENCE BOOKS

1. Kumar, A., "Stability Theory of Structures", Tata McGraw Hill Co. Ltd., 1985.
2. Prakash Rao, D.S., "Structural Analysis", University Press, 2007
3. Jain, A.K., "Strength of Materials and Structural Analysis", 2nd Ed., Nem Chand & Bros., 2008
4. Tung, Au. And Christano, P., "Structural Analysis", Prentice Hall International, 1987.
5. S. Ramamrutham, "Theory of Structures", Dhanpat Rai Publishing Company Private Limited-New Delhi; Ninth edition, 2014.
6. Indian Standard Plain and Reinforced Concrete, Code of practice - B.I.S. Code – IS 456: 2000.

BUILDING SERVICES-IV: ACOUSTICS, FIRE FIGHTING & LIFTS			
Course Code	BAP 310	Credits	02
Contact Hours (Hrs/Week)	02	Semester	06
Course Category	BSAE		

INTRODUCTION

The course discusses various acoustics treatments, fire fighting provisions and vertical transportation building services that are incorporated in building design.

COURSE OBJECTIVES

The objectives are:

- To understand conceptual and architectural understanding of acoustics and fire proofing of buildings
- To develop understanding of how to prepare relevant building services drawings.
- To develop understanding of planning acoustical treatment.

PREREQUISITE

None

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand and apply various aspects of fire proofing and vertical transportation in buildings.
- Understand parameters and various techniques for acoustical design of a building.

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, case studies, site visits, projects/ presentations/videos and quizzes. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples for better understanding. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted.

EVALUATION SCHEME:

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	Unit 1 Acoustics in architecture Need of study of acoustics, Development of acoustics through different periods including the historical development of amphitheatres and concert halls, auditoria. Fundamental characteristics of sound, behaviour of sound in enclosed space, sound intensity, sound pressure, sound level meter, Factor influencing hearing. Noise, echo, reverberation, resonance	07

	with solution, Sabin's formula.	
2.	<u>Unit 2 Acoustical designing techniques</u> Constructional and planning measures for good acoustical design. Acoustical materials, panel absorber, absorption coefficient of different materials from various sound absorbing materials. Case studies of acoustical sensitive interior space e.g. auditorium, recording studio etc. Acoustical designing, detailing, layout and space requirements. Control of noise pollution by landscape, buffer zone etc. in urban area, control of traffic noise.	07
3.	<u>Unit 3 Fire Fighting</u> Causes and spread of fire. Combustibility of materials and safety norms. Fire prevention, detection and fire fighting equipment- smoke detectors, monitoring devices, alarm systems, etc. Fire fighting systems and controls. Design of fire escapes for high rise buildings	07
4.	<u>Unit 4 Lifts</u> Types of lifts, their control, installation and operation. Definition of average lift carrying capacity, rated load, rated speed, RTT, etc. Details of lift section, machine room, equipment, lift well and lift pit. Design standards for lifts lobby, lift cars size etc. from building codes. Escalators and conveyors	07

REFERENCE BOOKS

1. "Fundamentals of Acoustics", Lawrence E. Kinsler, Austin R. Frey, Alan B. Coppens and James V. Sanders, John Wiley & Sons; 4th Edition, 2000.
2. "Acoustics in the Built Environment: Advice for the Design Team", Peter Mapp, Peter Sacre, David Saunders and Duncan Templeton, Architectural Press, 1993.
3. National Building Codes 2016 – Bureau of Indian Standards.

SETTLEMENT DESIGN			
Course Code	BAP 312	Credits	02
Contact Hours (Hrs/Week)	02	Semester	06
Course Category	DCC		

INTRODUCTION

Settlement design is the study and analysis of human relationship to the local ecosystems. The subject shall sensitise students to studying, analysing and understanding design response to the prevailing variables at settlement scale.

COURSE OBJECTIVES

- Enable the student to understand the city as a large system composed of physical components
- The modern planning process as applied to a settlement is studied.

PREREQUISITE

None

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Various factors and parameters for settlement design
- And develop sensitivity for planning of cities
- Various city planning done in the past.

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, site visits, projects/ presentations/videos and quizzes. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples for better understanding. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted

EVALUATION SCHEME:

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	Unit 1 History and components of city Overview of historical perspective of city design. Introduction to contemporary city as a physical system and components of city. Image structure of city of Kevin Lynch	07
2.	Unit 2 Circulation network Traffic and circulation: hierarchy of roads in Delhi Master Plan as a case. Circulation network as structuring element in a settlement. Transit hubs as a public space, for example metro stations having much other commercial/office	07

	space within itself. Understanding a street and street design.	
3.	Unit 3 Statutory norms and their impact on city design Basic Understanding of elements of Master Plan, Unified Building Byelaws (UBBL), NBC, Fire prevention norms, ECBC for their impact on settlements (Master Plan, UBBL, fire prevention norms as applicable to city of Delhi may be used for this purpose). Impact of contemporary policies/development models like mixed use, transit oriented development, on city design.	07
4.	Unit 4 Site level design issues Site planning, analysis and design; off-site and on-site factors; Basic understanding of urban renewal, re-development, revitalization. Concept of inclusive and smart city	07

REFERENCE BOOKS

1. Kostof Spiro, "The City As Assembled- The Elements of Urban Form Through History", A Bulfinch Press Book Little, Brown and Company, Boston, New York, London , 1992.
2. Gallion Arthur B., Eisner S., "The Urban Pattern: City Planning and Design", CBS Pub. And Distributors, Delhi, 1984.
3. Rossi Aldo, "The Architecture of the City", the MIT Press , Cambridge , 1982.
4. Jacobs Jane, "the Death and Life of Great American Cities", Vintage Books, A Division of Random House, New York, 1961.
5. Lynch Kevin A., " The Image of the City", MIT Press, Cambridge, USA, 1960
6. Lynch Kevin A., "What Time is this Place", MIT Press, Cambridge, USA, 1972
7. Whyte William H., "The Social Life of Small Urban Spaces", Conservation Foundation, 1980.

DESIGN MANAGEMENT			
Course Code	BAP 314	Credits	02
Contact Hours (Hrs/Week)	04	Semester	06
Course Category	DEC		

INTRODUCTION

An architect needs to understand the business environment in which he/she is supposed to work. There exist different types of projects and stakeholders. In order to broaden the perspective of students and give them better understanding of the project ecosystem, this subject is thus being introduced to help explore various possibilities/ roles that exist for architects.

COURSE OBJECTIVES

- To develop greater understanding towards architectural project ecosystem
- To expose the students to the desired requirements of the construction industry from architects
- To enhance the leadership and management qualities of students

PREREQUISITE

None

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Develop a holistic understanding of the design process and construction business in a project
- Enhanced skill set of communication, analysis and management
- Understand the requirements of the construction industry

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, case studies, site visits, class discussions, debates, role plays, interviews, projects/ presentations/videos and quizzes. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples for better understanding. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted.

EVALUATION SCHEME:

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
0	4	0	--	Yes	--	35	--	15	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Introduction to Design Management: Project and its stakeholders. Operative and management framework. The responsibilities of design managers in different roles. The relevance and need of design management. Design Management as a tool to establish link with the end-user.	10

2.	An Overview Project examples where design management has been effectively used. Students may be encouraged to interact with design managers in the industry to understand the challenges associated with the profile. Analysis of a case study to understand the matrix of design management.	10
3.	Learning and applying Design Management Techniques Basic understanding of the project life cycle like project planning, financing, execution, commissioning, etc. Implementing efficient design management framework, matrix for design management, etc. Document administration and management; types, need and importance and current practices of document management in the field, etc. Project coordination- in various stages of project like pre-design, during design development, during execution stage and post execution stage, etc. Controlling the site and keeping a track on site development; plus resolution of site issues, etc. Technical writing- types and process, etc. Communication- what is communication and how efficient and effective communication is done, etc. Project Marketing	16
4.	Application of skills learnt This may be ascertained by giving assignments to students in the form of case study, debates, panel discussion, write-ups, documentary, etc. as deemed suitable for the project undertaken.	20

REFERENCE BOOKS

1. Kathryn Best, "Design Management: Managing Design Strategy, Process and Implementation", AVA Publishing SA, 2006
2. Kathryn Best, "The Fundamentals of Design Management", AVA Publishing SA, 2010.

INTRODUCTION TO HEALTHCARE DESIGN			
Course Code	BAP 316	Credits	02
Contact Hours (Hrs/Week)	04	Semester	06
Course Category	DEC		

INTRODUCTION

With advancements in the healthcare industry, there has been a great need for architects to understand the technicalities involved in the establishment of health care infrastructure. This course is an attempt to expose them to these requirements.

COURSE OBJECTIVES

- Introduce students to healthcare design
- Expose the students to the socio-economic impact on the health of the concerned population.

PREREQUISITE

None

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- how public health, healthcare facilities and healthcare design are interrelated to each other.
- hierarchy and type of healthcare facilities, emphasis on epidemiology, nomenclature and accreditation.
- the parameters that govern the design of a healthcare facility and its impact on the concerned population.
- evidence based design and energy efficiency in healthcare facilities.

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, case studies, site visits, class discussions, debates, projects/ presentations/videos and quizzes. Faculty members strive to make the classes interactive so that students can correlate the theories with practical examples for better understanding. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted.

EVALUATION SCHEME:

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
0	4	0	--	Yes	--	35	--	15	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Introduction Introduction to world healthcare programs, government initiatives in India and abroad and scope of healthcare development in the present scenario. The importance of epidemiology study, population demographics and public health. Introduction to urban and rural healthcare needs. Analysis of demand and supply in developed, developing and under developed countries.	14

2.	Public Health and Healthcare Facilities Study and analysis of healthcare demands of concerned population, projected needs and estimated healthcare requirement in future. Visits to a healthcare facility in urban/neighbouring rural area may be conducted. Documentary of issues and healthcare related problems and need. Type of healthcare facility with respect to population density, regional parameters, land resource and other aspects.	14
3.	Healthcare facilities and Healthcare Design Primary and secondary case studies to understand the functioning of a teaching and non-teaching healthcare facility. The hierarchy of healthcare facilities in terms of services provided and their governing parameters. Accreditation of healthcare facilities and its impact on public trust. Evidence based design and importance of energy efficiency.	14
4.	Design Parameters Understanding the basic parameters leading to a good functional design. Study and analysis of flow of thought processes, segregation of spaces, services and other governing parameters. Understanding basic nomenclature, terms and flow paths. Design concerns and impact of health indicators on healthcare design. Understanding Drawing and drafting symbols, techniques and presentation skills.	14

REFERENCE BOOKS

1. Andrea Boeke, "Architecture for Healthcare Book", Images Publishing Group Pty Ltd; 01 edition 2007
2. Chris Wright and Julius Sim, "Research in Health Care: Concepts, Designs and Methods Book", Nelson Thornes Ltd,, 2006.
3. G D Kunders, "HOSPITALS: Facilities Planning and Management Book", McGraw Hill Education; 1 edition, 2004.
4. Richard L. Kobus , Ronald L. Skaggs, Michael Borrow, Julia Thomas, Thomas M. Payette and Sho-Ping Chin, "Building Type Basics for Healthcare Facilities Book" Wiley, 2008.
5. Richard L. Miller and Earl S. Swensson,"New Directions in Hospital and Healthcare Facility Design", McGraw-Hill Inc.,US , 1995
6. Richard L. Kobus and Ronald L. Skaggs, "Building Type Basics for Healthcare Facilities", Wiley, 2000.

ARCHITECTURAL MODEL MAKING TECHNIQUES			
Course Code	BAP 318	Credits	02
Contact Hours (Hrs/Week)	04	Semester	06
Course Category	DEC		

INTRODUCTION

Model making is an effective tool for visualizing the spaces in three dimensions for architects and designers. This subject exposes students to various techniques associated with model making.

COURSE OBJECTIVES

- To use model making as a visualization tool for space making
- To use model as a communication tool with different stakeholders

PREREQUISITE

None

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Explore the work of professional model makers using professional techniques, with guidance and direction given by specialist tutor.
- Obtain an enhanced understanding for working with simple materials like resins, silicones, plastics and polymer clays.
- Gather a greater insight into an inspiring, creative and sometimes overlooked career option.

PEDAGOGY

The teaching-learning of the course would be organized through lectures, assignments, case studies, site visits (local/outstation), surveys, studio discussions, model / 3D making, sketching/drawing, hands-on activities, projects/ presentations/videos and Internal Juries. Use of ICT, web-based sources as well as flipped classroom teaching will be adopted.

EVALUATION SCHEME:

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
0	4	0	--	Yes	--	35	--	15	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Introduction <ul style="list-style-type: none"> • Introduction to the importance of three dimensional visual representations of architectural projects • Introduction to basic materials used in model making, their construction techniques and model making tools. 	08
2.	3D representation techniques <ul style="list-style-type: none"> • Study and analysis of the type of model desired at various stages of design ranging from study models to professional model making, which helps in 	08

	design exploration and space creation.	
3.	3D representation hands on work <ul style="list-style-type: none"> • Work experience of using materials like thermocol (usual and compressed), photographic mount boards etc. and 3D printing. 	26
4.	Complementary appendages <ul style="list-style-type: none"> • Study and analysis of various additional objects required to scale a model like trees, cars, lampposts, human figures etc. Understanding their various types, material and construction methodology and storage techniques. 	14

REFERENCE BOOKS

1. Nick Dun, "Architectural model making", Laurence King, 2010.
2. Arjan Karssen, Bernard Otte, "Model Making: Conceive, Create, Convince", Thames and Hudson, 2014.
3. Wolfgang Knoll and Martin Hechinger, "Architectural models, Construction techniques", second edition, Ross Publishing, 2007.

B.ARCH SYLLABUS SEMESTER VII & VIII
Choice Based Credit System (CBCS)

Detailed Course Curriculum/Scheme of Examination-Semester VII Bachelors of Architecture, IGDTUW

FOURTH YEAR					
Seventh Semester					
S.No.	Code	Subject	(L-S-P)	Credit	Category
1	BAP 401	Architectural Design - VII	0-10-0	10	DCC
2	BAP 403	Building Materials & Construction Technology – VII	0-6-0	6	BSAE
3	BAP 405	Women & Sustainable Development	0-3-0	3	DCC
4	BAP 407	Advanced Building Services-VII	2-0-0	2	BSAE
5	BAP 409	Seminar	0-0-4	2	DCC
6	BAP 411	Strategic Design Thinking	0-3-0	3	DEC
	BAP 413	Emerging Phenomenon and Architecture			
	BAP 415	Cultural Landscape			
	BAP 417	Advanced Programming			
	BAP 419	Any other elective			
7	GEC 401	Generic Open Elective	0-0-4	2	GEC
			Total	28	
Eighth Semester					
S.No.	Code	Subject	(L-S-P)	Credit	Category
1	BAP 402	Architectural Internship/ Professional Training	0-18-0	18	HMC
2	BAP 404	General Open Elective (MOOC)	0-0-2	2	GEC
			Total	20	

- Departmental Core Courses (DCC)
- Humanities, Social Sciences, Management and Skill/Entrepreneurship Development Courses (HMC)
- Basic Science and Applied Engineering Courses (BSAE)
- Departmental Elective Courses (DEC)
- Generic Open Elective Courses (GEC)

ARCHITECTURAL DESIGN-VII			
Course Code	BAP 401	Credits	10
Contact Hours (Hrs/Week)	10	Semester	07
Course Category	DCC		

INTRODUCTION

This course shall create awareness about the causes and consequences of housing problems and to impart knowledge about the possible solutions.

COURSE OBJECTIVES

- To recognize housing issues at national context in terms of magnitude of problems, outcomes of initiatives and related factors.
- To enable the students to understand the fundamentals of housing needs, housing finance and housing techniques with relation to social and environmental effect.
- To inculcate the importance of services integration and construction in spatial planning in the context of design of high-rise buildings and service intensive buildings.
- To sensitize concepts related to cost reduction in housing: techniques and related issues, alternative building materials. Residential environment: user's satisfaction and behavioural aspects, evaluation of housing development

PREREQUISITE : NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Housing as a social issue and as an infrastructure
- Housing needs and demands
- Implication of statutory norms and market forces on the typology of housing and designing of housing for a given/explored number of households.
- Housing design process, different stages in project development, layout design including utilities and common facilities.

PEDAGOGY

Classroom teaching is supported by giving handouts, PowerPoint slides, and exposure to Site visits/field visits to specific building pertaining to the typology chosen. Readings/Short Movies. Students may visit sites for collecting context specific data for getting a better understanding of real- life project details. Stage by stage submission will be followed by an internal jury where the student work will be critically examined. Summative assessment of the studio work could be achieved through panel discussions, presentation, peer review, public review, Criteria based evaluation etc.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	10	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Content	Contact Hours
1.	Introduction <ul style="list-style-type: none">• Introduction or acquainting with the various ways of designing a Housing Project in urban/rural context i.e. low/medium rise- high density, high rise-high density etc.• Introduction to the site and project brief.	20
2.	Literature and Case Study <ul style="list-style-type: none">• Secondary research Case study/Review of different forms of housing in both developed and developing countries.• Aspects of socio-economic, cultural, construction technique etc. influencing housing design may be explored.	10
3.	Conceptual Design Proposal <ul style="list-style-type: none">• Conceptual design Proposal of the chosen typology incorporating varied formats of grouping/massing etc. on the site (as given) using specific bye-laws and regulations.	90
4.	Design Development <ul style="list-style-type: none">• Integrating knowledge of Structures, Building Construction & Services Integration of services and structural development to the finalized concept proposal necessary on site and making relevant drawings for the same.	20

REFERENCE MATERIAL

1. Clapham, D., Clark, W. A. V. and Gibbs, K., "The Sage Handbook of Housing Studies. London", Sage Publications, 2012
2. Mathur G C, "Low-cost housing in developing countries" South Asia Books 1993 Hideaki Hareguchi, "A Comparative analysis of 20th century houses", Academy Editions, 1988
3. Chiara Joseph De et al, "Time saver standards for housing and residential development. McGraw Hill", New York, 1995
4. Mehta, M. and Mehta, D, "Metropolitan housing market" Sage Publications, New Delhi, 1989
5. National Building code
6. Master Plan of Delhi 2050 and 2021.

BUILDING MATERIALS & CONSTRUCTION TECHNOLOGY – VII			
Course Code	BAP 403	Credits	06
Contact Hours (Hrs/Week)	06	Semester	07
Course Category	BSAE		

INTRODUCTION

This subject gives an insight about detailing aspects of construction as well as the typical systems of construction and management of buildings. The aim of this course is to develop the understanding about the detailing aspect of construction in order to facilitate fast and modular construction and also the technology driven management systems in buildings. The aim of this course is to also familiarize the student with understanding of building components used in advanced structures, large span structure

COURSE OBJECTIVES

- To acquaint students with working drawing of various service areas of buildings and also interiors of buildings
- To familiarize students with fast and modular construction techniques/systems.
- To introduce students to alternative cost effective construction techniques
- To understand the format of communicating the technical details of projects to construction teams.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- The proper system of dimensioning in a working drawing in a working drawing.
- Various constituents of a working drawing.
- The significance of working drawings as a tool for project costing and management

PEDAGOGY

Classroom teaching is supported with preparation of drawings and site visits.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	6	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Content	Contact Hours
1.	Work Drawings of Interior Works <ul style="list-style-type: none">Working drawing of Interiors Layout of a Kitchen design, public toilet design, service layout of electrical lines, fixtures and lighting, Submission andWorking Drawings of any commercial space of area up to 200 sqm like restaurant, office, etc.	28
2.	Speedy Construction Techniques <ul style="list-style-type: none">Introduction to Pre-stressing, Post Tensioning and Pre Tensioning, Prefabrication, Lift Slab Techniques, Tilt up Construction, Precast Construction – Column Beam Joints, Staircase, Roof, Walling.	12
3.	Cost Effective Structures <ul style="list-style-type: none">Cost effective Building structures Bamboo Structures: Bamboo reinforced concreteStructures like ferro cement channels, plank and joist. Brick Roof: Pyramid, Reinforced Brick Concrete, Filler Slab.	24
4.	Work Drawings of Services <ul style="list-style-type: none">Working drawing /Layout of Gas pipeline installation system and other building services.	20

REFERENCE BOOKS

1. Kumar, S.K, "Building Construction", 19th Ed., Standard Publishers Distributors, 2001.
2. Punamia B.C., Jain Ashok Kr., Jain Arun Kr., "Building Construction", 10th Ed., Laxmi Publications Pvt Limited, 2008.
3. Rangwala, S.C., "Building Construction", 19 th Ed., Charotar Publishing House, 2001.
4. McKay, W.B., "Building Construction", Vol. I, Longman, 2005.
5. McKay, W.B., "Building Construction", Vol. II, Longman, 2005.
6. McKay, W.B., "Building Construction", Vol. III, Longman, 2005.
7. Emmitt, Stephen and Gorse, "Barry's Introduction to Construction of Building", 3rd Edition, Wiley-Blackwell, 2014.
8. Rosenthal, "Structural Decisions" Chapman & Hall, University of Michigan, Michigan, 1962.
9. Levy, M. and Salvadori, M., "Why Building Fall Down: How Structures Fail", W. W. Norton & Company; New York, 1994.
10. Levy, M. and Salvadori, M., "Why Buildings Stand Up: The Strength of Architecture", W. W. Norton & Company; New York, 1991.
11. Salvadori, M., "Structure in Architecture" Pearson; 4th Edition ,2016.
12. Styles, Keith, "Working Drawings Handbook", 3rd Edition, Architectural Press; UK ,1998.

WOMEN AND SUSTAINABLE DEVELOPMENT			
Course Code	BAP 405	Credits	03
Contact Hours (Hrs/Week)	03	Semester	07
Course Category	DCC		

INTRODUCTION

Women form nearly half of the global population, and hence sustainable development cannot be achieved without empowering women. Women are the primary caregivers, meal providers, and teachers and therefore they can play decisive roles in shaping the values, prejudices, virtues and opinions of the future generations, which eventually become factors that govern the world. Hence women empowerment can have an incalculable impact on humanizing mankind, and promoting peace and dialogue in the world, which are imperatives for a sustainable future, and improvement of economic, social and environmental indicators. Subsequently, when women are elevated, society is elevated.

Nevertheless, women remain one of the most disadvantaged groups globally. The highest percentage of persons below poverty line, continue to be women. Hence any improvement in women's condition will directly transfer to the future of the planet. But, there continues to be a lack of equality and equity in access to resources legal rights by women.

This course will attempt to sensitize the students towards the need of women empowerment, women inclusive and sensitive designs and also the unique role women can play in creating a more peaceful and sustainable world.

COURSE OBJECTIVES

- To sensitize the students towards the need for women empowerment to achieve the goal of sustainable development.
- To sensitize the students towards various challenges in women empowerment.
- To sensitize students towards more gender inclusive design for improvement in indicators of health, safety, education, quality of life of women.
- To sensitize students towards the unique strengths women can bring in development of peaceful societies.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Have deeper understanding of UN-SDG goals and understand its practicality.
- Developing awareness in role in the management, conservation, exploitation and utilization of natural resources as consumers and educators, despite having serious limitations in access and control of these resources.

PEDAGOGY

Case studies, surveys, design audit of buildings, interactions and discussions with women architects/planners, Mapping women needs and aspirations from design, book readings, discussions, field visits, audio visual resources etc. Assignments on Gender Inclusive Designs of public urban spaces like streets, shopping centres, metro stations, public parks etc

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	3	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Content	Contact Hours
1.	Role of women in architecture <ul style="list-style-type: none">Exploring the unique role women can play in sustainable design and planning process, exploring the impact and significance of women's role on social, economic and environmental indicators.	12
2.	Need for women empowerment <ul style="list-style-type: none">Gender and economic development, gender and social development, gender and environmental development, challenges and hazards of disempowered women, case studies on impact of women empowerment of social, economic, environmental indicators.	12
3.	Gender sensitive design <ul style="list-style-type: none">The need of gender inclusive designs, mapping the challenges of gender inclusive designs, audits of the design and planning of various building and space typologies from gender perspective, need of women professionals in decision making process and governance, mapping needs and aspirations of women from design.	12
4.	Seminar <ul style="list-style-type: none">Study of selected case studies of work done by women in the field of Architecture and allied areas.Expert lectures and guest talks.	6

REFERENCE MATERIAL

1. Toy Maggie, "The Architect: Women in Contemporary Architecture" Watson Guptill; First Edition (April 1, 2001)
2. Dean Dewhirst, "Chasing the Sky: 20 Stories of Women in Architecture", Unabridged, February 6, 2018
3. Madhavi Desai, "Women Architects and Modernism in India: Narratives and Contemporary Practices, Routledge, 2017.
4. UNICEF document of Women and Sustainable Development.

ADVANCED BUILDING SERVICES-V			
Course Code	BAP 407	Credits	02
Contact Hours (Hrs/Week)	02	Semester	07
Course Category	BSAE		

INTRODUCTION

To develop an understanding of the advanced building services and their application in the design proposals of buildings.

COURSE OBJECTIVES

- To create awareness of designing energy efficient building envelopes that respond to the climate of a place advocating the application of renewable energy systems
- To promote the application of energy efficient lighting and HVAC systems to reduce energy demand.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able:

- To develop conceptual and practical understanding of the application of advanced services in advanced Structures, large span structures, high rise building and cost effective construction techniques.
- To appreciate the role of natural resources in building construction and maintenance.

PEDAGOGY

Specialized lectures from technical people in the field, Practical and site based exercises to make the data more comprehensive Site visits of buildings where different types of advanced services equipment have been installed, their working, studying the merits and demerits of the system. The thrust shall be on understanding the use and application of the services and not the calculation or numerical part.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIS	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Content	Contact Hours
1.	<u>Unit 1 Services for Tall Building</u> <ul style="list-style-type: none"> • Introduction to advanced services related to tall buildings like vertical circulation, firefighting systems, lighting systems, plumbing and electrical systems, green roofs. 	7

	<ul style="list-style-type: none"> Lighting design of: Residential units, Shops & Restaurants, general office, conference hall, Art – gallery and Museum Parks & playgrounds Road/area lighting and Landscape Lighting. 	
2.	Unit 2: Automated Parking systems and Gas Installations <ul style="list-style-type: none"> Automated Parking System Introduction, Types, Working and Advantages of automated parking system, L.P.G / Biogas installations, their location and layouts in residential and non-residential buildings. 	7
3.	Unit 3 :Waste Treatment & Management <ul style="list-style-type: none"> Introduction to Waste collection, treatment and disposal. Understanding Reduce– Reuse–Recycle model. Thermal treatment Dumps and Landfills. Biological waste treatment. Wastewater treatment, Waste Management and behavioural management for waste control at building and city level. Control Room Code of Safety prescribed in NBC. 	7
4.	Unit 4 : Integrated Building Management Systems <ul style="list-style-type: none"> Introduction to Building Energy Analysis & Ecosystem management software. Introduction to the Integrated Building Management System (IBMS), the list of utilities(water supply,electrical,plumbing,HVAC etc requirement), safety , communication systems and security systems that are generally monitored and controlled through IBMS and the basic knowledge on how they are designed and installed. 	7

REFERENCE MATERIAL

1. Edwards, B.” Green: Rough Guide to Sustainability”, RIBA Publications,2010.
2. Szokolay, S. V. ,”Introduction to Architectural Science”, Architectural Press,2008.
3. TERI (2005) Sustainable design manual, Vols 1 & 2, The Energy and Resource Institute (TERI), New Delhi, 2005.
4. Gupta, V., “Energy and Habitat”, Wiley Eastern Limited, New Delhi, 1984.
5. Carlson, Reinhold A, “Understanding Building Automation Systems: Direct Digital Control, Energy Management, Life Safety, Security, Access Control, Lighting, Building Management Programs”, R.S. Means Company Ltd, 1991.
6. McGowan, John J, “Building Automation Online”, Fairmont Press, 2007.

SEMINAR			
Course Code	BAP 409	Credits	02
Contact Hours (Hrs/Week)	04	Semester	07
Course Category	DCC		

INTRODUCTION

The Seminar shall be a research paper on a subject of theoretical nature on any aspect of architecture. The thrust of the seminar shall be on achieving a thorough understanding of the topic of study and on the ability to present it to an intelligent and critical audience.

COURSE OBJECTIVES

- To familiarize students for writing and presenting a research topic/paper based on literature study, review and case study
- To prepare students in oral along with visual presentation.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Write a research paper based on literature review and case study.
- Develop critical understanding, logical reasoning, structured argument / discussion about the topic chosen.
- Work in a group for presentations which will also develop team building and leadership skills.

PEDAGOGY

Classroom teaching through multimedia supported by case studies of building. Encouraging students to conduct interviews through visits to various sites. Lectures/ Workshops on: Various mediums of communication

- Oral communication: Language skills, Understanding the audience, transmitting ideas, etc.
- Written Communication: Language Skills, structuring of ideas, various types of written Communication, Understanding the reader /purpose of the communication, Preparation of drafts, finalization of content.
- Graphic Communication: Use of software and other media suitable for graphic communication.
- Electronic Communication: Introduction to presentation techniques & formats using computers.
- Group Communication: Communication within a group, group presentations, group discussion etc.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIS	ETEP
0	4	0	--	Yes	--	35	--	15	-	--	50

CONTENT

S. No	Content	Contact Hours
1.	Introduction to the Seminar <ul style="list-style-type: none">Defining objectives and discussion on identifying and finalizing the study area.Formulating aims and objectives of study and assumptions.Introduction to various written and verbal communication techniques.Understand the structure of a research paper.	12
2.	Secondary Research <ul style="list-style-type: none">Study based on literature,Prepare a methodology based on literature study,Descriptive writing about a paper, demonstrating the comprehension of the subject matter, academic format, research methods and vocabulary- involving paraphrasing: Presentation of the paper(s) that the student has read	12
3.	Research methods and data presentation <ul style="list-style-type: none">Application of various Quantitative and Qualitative ResearchMethods for studySelecting a research method for case study and document, analyze and present findings.	20
4.	Analysis and Presentation <ul style="list-style-type: none">Conclusive inferences and analysisPresentation of the documented data, insights/findings and inferences and conclusions using a Visual Presentation Technique.	12

REFERENCE BOOKS

1. Eric H Glendinning & Beverly Holmstrom, "Study reading – A course in reading skills for academic purpose", Cambridge University Press, 1992.
2. John Krizan, "Good Style – writing for science and technology", E & FN Spon, an Imprint of Chapman & Hall, 1992.
3. Smith, Korydon, "Introducing Architectural Theory: Debating a Discipline"; Routledge-Taylor and Francis Group, New York, London, 2012.
4. Walliman Nicholas, "A step by step guide for the first time researcher", Vistaar Publications; New Delhi, 2008.

STRATEGIC DESIGN THINKING			
Course Code	BAP 411	Credits	03
Contact Hours (Hrs/Week)	03	Semester	07
Course Category	DEC		

INTRODUCTION

Strategic Design Thinking is a course designed powered by user experience research methodologies to empower the students in designing humanistic and contextually relevant imaginative, creative, transformational and intuitive strategies, business processes, tools and techniques. This course shall offer a creative problem solving process that uses elements from the designer's toolkit like empathy & experimentation to arrive at new solutions. This course seeks to use, embed and innovatively apply the design based creative, empathic, integrative, systemic, synergetic, holistic and human centric thinking skills and approaches to design processes and implementation to make ecosystems more efficient, effective and efficacious.

COURSE OBJECTIVES

- To foster empathy and deep understanding of the users in terms of their life, needs, aspirations and challenges.
- Understand various tools and methods suitable for applying design thinking discovery, interpretation, ideation, experimentation and evolution and stimulate creativity in yourself and others and develop new thinking skills.
- Learn collaborative skills and develop systemic thinking, listening to others and understanding multiple stakeholder's perspectives.
- Learn human centered methods throughout all stages of the design thinking process.
- Gain adequate competence enabling the students to understand and map the opportunities and design transformational strategies in Architecture and Design.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Develop a human-centric mindset while designing, innovating, developing, and testing solutions for new products, services and processes.
- Understand the role of innovation in the digital era and drive disruptive innovation.
- Create a design thinking culture to drive innovation in an organisational setup.
- Envisage innovative solutions individually and in teams for maximising business impact.
- Develop the ability to create and test prototypes that are customer-centric and innovative.

PEDAGOGY

The course will be offered in a highly experiential and transformational way which shall include live projects, industry and urban and rural exposure, field studies, environmental exposure and immersive and participative live-in case studies in various setups. The course provides many opportunities to apply these new ways of thinking through class exercises and a course project, where one will develop creative concepts for an assigned topic.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	3	--	--	--	50	--	--	-	--	50

CONTENT

S. No	Content	Contact Hours
1.	Introduction to Design Thinking and its importance in architecture. <ul style="list-style-type: none">Theoretical information and short supporting assignment on topics like role of creativity in problem solving, study of inhibitions, conformity and vertical thinking.Complementary nature of systematic and creative thinking in various stages of the design process.Theories of well-known social psychology research studies to explain user behaviour and anticipate the impact on future design.	8
2.	Understanding and identification of issues and concerns <ul style="list-style-type: none">It involves identifying the needs of a target audience, getting under their skin and finding out what they value, what they want and how they look at the world.Introduction to tools to view users and their behaviour and their needs in the context of their lives.Developing questionnaires, empathy maps development, photographic studies of products with users, deep user interview etc, field observation and selecting suitable techniques to study user behaviour and reactions.Understanding of market demands and manufacturing constraints.	12
3.	Problem Definition <ul style="list-style-type: none">The define stage in the process shall endeavour to synthesize the scattered findings in the field of the users into powerful insights.Various tools shall be introduced to synthesize the field observational study.	10
4.	Ideation and Implementation <ul style="list-style-type: none">Introduction to various tools for ideation in design thinking.Assignments on using ideation/analysis techniques like brainstorming, synectics etc to develop creative attitude and open mind.Generation of ideas, creating scenarios, sketches and prototypes, before integrating some of the business constraints.Documentation and interpretation of data and formulating conclusions, role of creativity in understanding of latest needs, comparative analytical studies in other creative fields. Implementation Working on iterate ideas in teams/individuals to develop/prototyping a range of promising possible solutions.	12

REFERENCE MATERIAL

1. Edward De Bono Lateral Thinking: Creativity Step by Step, Edward De Bono, 1970.
2. John Fiske, "Communication Theory," in Introduction to Communication Studies London: Routledge, 1990.
3. Norbert Wiener, "Cybernetics in History" and other excerpts, The Human Use of Human Beings, London: Free Association Books, 1950
4. Jones J.C., Design Methods: Seeds of Human Futures, Wiley Inter-science, London, 1978
5. Victor Papanek , "Design for the real world-Human Ecology and Social Change", Academy Chicago Publishers; Second edition ,1985
6. IDEO's Human-Centered Design Toolkit: Very usable guide to practising design thinking.
7. Jon Kolko," Exposing the Magic of Design: A Practitioner's Guide to the Methods and Theory of Synthesis", 2015
8. Nadia Roumani,"Social Impact by Design", Columbia University Press, 2017
9. Don Norman, "Living with Complexity", IT Press, 2010

EMERGING PHENOMENON AND ARCHITECTURE			
Course Code	BAP 413	Credits	03
Contact Hours (Hrs/Week)	03	Semester	07
Course Category	DEC		

INTRODUCTION

The course would introduce students to the futuristic technological advancements having an impact on the built environment. The course aims to sensitize students on how different seemingly unrelated socioeconomic, cultural and technological trends have an impact on architecture and planning and vice versa.

COURSE OBJECTIVES

- Sensitizing the students on how access to information may help in optimizing the efficiency of the built environment.
- Appreciate the concept of Cyber Physical Systems in a city and its role in the built environment.
- Understanding how using technology can help adapt to altering environments to improve quality of life for people.
- Identifying the need for flexible design in the contemporary world.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- The concepts of IT as applicable to the built environment.
- How using information design could make people centric.
- How technology can help improve the efficiency and comfort in the built environment.
- The interconnectedness of seemingly isolated phenomena and their impact on future scenarios of the built environment.
- The Role of technology in improving the quality of life of people with a given set of challenges.
- The tangible and intangible interconnectivities within various phenomena of the world.

PEDAGOGY

Classroom teaching through multimedia supported by case studies. Students may be encouraged to work in the computer lab of the department for the course.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	3	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Content	Contact Hours
1.	Context <ul style="list-style-type: none">• Potentials and Hazards of various social, cultural, economical and technological trends on built environment• Cyber Physical Systems for a contemporary city• Introduction to Automation in buildings, Impact of new materials and devices on built environment. Design as social capital.	08
2.	Biomimicry/biomimetics <ul style="list-style-type: none">• Principles, philosophy and examples.• Discussions/ Presentations on Works/Philosophies of masters (eg. Antoni Gaudi, Norman Foster, Michael Pawlyn)• Introduction to Works of Neri Oxman (MIT Media Lab).	10
3.	Emerging Technologies <ul style="list-style-type: none">• Impact of Emerging Technological trends: Artificial Intelligence , Machine learning , Virtual and Mixed reality, Internet of things in altering environments• Understanding concept of simulation• Study of selected case studies.• Design as social capital	12
4.	Big Data <ul style="list-style-type: none">• Big Data and Smart Cities and New Interpretations of Urban Design.• Exploring how Big Data can impact space design• Concept of Urban Informatics• Concept of compact cities, mobility on demand, Urban Modelling, Simulation and Prediction.	12

REFERENCE MATERIAL

1. Steenson, Molly Wright, "Architectural Intelligence: How Designers and Architects Created the Digital Landscape", MIT Press; USA, 2017.
2. Mitra, Kanaani, Dok, Kopec, "The Routledge Companion for Architecture Design and Practice Established and Emerging Trends", Routledge Taylor and Francis Group, 2016.
3. Edited by Shen, Zhenjiang, Li, Miaoyi, "Big Data Support of Urban Planning and Management: The Experience in China (Advances in Geographic Information Science)", Springer; Switzerland, 2018.
4. Thakuria, Piyushmita, Tilahun, Nebiyu, Zellner, Moira, "Seeing Cities Through Big Data: Research, Methods and Applications in Urban Informatics", (Springer Geography); Switzerland, 2017.
5. Foth, Marcus, Forlano, Laura, Satchell, Christine, Gibbs, Martin; Donath, Judith, "From Social Butterfly to Engaged Citizen: Urban Informatics, Social Media, Ubiquitous Computing, and Mobile Technology to Support Citizen Engagement", MIT Press; USA, 2011.
6. Zito, Phil, "Building Automation Systems A to Z: How to Survive in A World Full of BAS", Independent Publishing Platform, 2016.
7. Easterling, Keller, "Extra state craft: The Power of Infrastructure Space", Verso; UK and USA, 2016.

CULTURAL LANDSCAPES			
Course Code	BAP 415	Credits	03
Contact Hours (Hrs/Week)	03	Semester	07
Course Category	DEC		

INTRODUCTION

Cultural landscapes are spaces of nature created by human culture and technology. They have distinct spatial patterns and settlement practices that are shaped by social routines as well as geographical conditions. Cultural landscape is also a way of seeing, thinking and interpreting urban, suburban, rural and industrial places. It applies rich and productive cross-disciplinary approaches that entangle cultural practices, and bio-physical systems in the pursuit of uncovering the form, meaning and processes that differentiate one locale from another.

Cultural landscapes can range from thousands of acres of rural land to homesteads with small front yards. They can be man-made expressions of visual and spatial relationships that include grand estates, farmlands, public gardens and parks, college campuses, cemeteries, scenic highways, and industrial sites.

Cultural landscapes are works of art, texts and narratives of cultures, and expressions of regional identity. They also exist in relationship to their ecological contexts

COURSE OBJECTIVES

- Forge new connections and identify unexplored lenses for enriching historical research, site interpretation, preservation, planning and design within complex, and often contested, cultural landscapes.
- Critically analyse different works related to geographers, architectural historians, landscape architects, preservationists, anthropologists interpret, manage, plan and design the built and shaped environment.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to gain:

- Exposure to the varied terms, theoretical approaches and themes that characterize contemporary research, management and design of cultural landscapes.
- Research skills for locating and evaluating written and visual sources about vernacular and designed cultural landscapes.
- The ability to apply carried critical frameworks and analytical methods through writing and graphic diagramming or representation.
- The understanding to create new ways of working at the intersection of design, planning, preservation and sustainability.

PEDAGOGY

Active participation in discussion and the writing of bi-weekly positions papers based on the readings . Each student will lead one discussion section and pursue an independent project

focused on the research, description, analysis, and interpretation of one cultural landscape, or network of cultural landscapes .

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	3	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Content	Contact Hours
1.	Definitions and Interpretations <ul style="list-style-type: none"> Meaning of landscape, and the use of history and memory – in our own lives (personal narratives and identities) and as part of a larger cultural, national and global collective. Ethnoecology; Concepts of Place, Human-Nature Relationships Criticisms of Environmental Determinism, Birth of Cultural Geography. 	8
2.	Landscape Theory and Phenomenology <ul style="list-style-type: none"> Introduction to changing perceptions of man's relationship with nature in various phases of history; responses and attitudes to nature and landscape resources as a function of this perception. Environmental and Behavioural theories: Entropy, Prospect and Refuge, Defensible space etc. 	10
3.	Study and Relevance <ul style="list-style-type: none"> Examination of Indian/Non-Indian sites as they have been re-valued, re-appropriated and reshaped over time. It also includes an investigation of other land-shaping forces – colonization, federal policies, the culture of capitalism and consumption, shifting public values, etc. Example: Ancient Indian traditions; siting of structures, complexes and cities; symbolic meanings and sacred value attributed to natural landscapes; traditional landscapes such as ghats, gardens, <i>kunds</i>, sacred groves etc. Landscape in myth and poetry. 	12
4.	Analysis and Application <ul style="list-style-type: none"> The comparative analysis of examples of landscapes separated in time and space: siting, relationship to surroundings, use of landscape elements, function, scale, symbolism, etc. Illustrative range of examples from various geographic locations and periods, highlighting aspects of Form, Space and Order. Example: The Persian tradition and its far reaching influence Eastern Civilisation: China and Japan Ancient and medieval period in India; Mughal and Rajput Landscapes. 	12

	<ul style="list-style-type: none"> • Influences and linkages across cultures and traditions, e.g Chinese tradition and the English Landscape style, influence of Persian traditions towards the West and East. 	
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REFERENCE MATERIAL

1. Agnew, J. A. 1989 The Devaluation of Place in Social Theory. In The Power of Place: Bringing Together Geographical and Sociological Imaginations, edited by J. A. Agnew and J. S. Duncan, pp. 9-29. Unwin-Hyman, London.
2. Bradley, R. 2000 An Archaeology of Natural Places. Routledge, London. Ch. 3.
3. McGuire, R. 1991 Building Power in the Cultural Landscape of Broome County, New York 1880 to 1940. In The Archaeology of Inequality, edited by R. H. McGuire and R. Paynter, pp. 102-124. Blackwell, Oxford.
4. Schama, S. 1996 Landscape and Memory. Vintage Books, New York. Pp. 100-120, 385-399.
5. Ingold, T. 1993 The Temporality of Landscape. World Archaeology 25(2):152-174.
6. Dolores Hayden, "Urban Landscape History: The Sense of Place and the Politics of Space," in P. Groth and T. Bressi, eds., Understanding Ordinary Landscapes, New Haven, Yale University, 1997, pp. 111-133. Kofi Boone, "Black Landscapes Matter," Ground Up Journal 6 (2017).

ADVANCED PROGRAMMING			
Course Code	BAP 417	Credits	03
Contact Hours (Hrs/Week)	03	Semester	07
Course Category	DEC		

INTRODUCTION

This course takes a computer science view of design, applying both the science and art of computing to design problems, in relation to creation, presentation, analysis, evaluation, interaction or aesthetic expression; in real and imagined applications, both perceived and conceived. This course aims to prepare students to modelling geometry through scripted development of parametric schemes for architecture applications — that is, to introduce students to basic scripting with a focus on algorithms relating to form making and to reinforce and extend basic concepts of parametric modelling.

COURSE OBJECTIVES

- To enable flowering of aesthetic sensibilities and a realization of the appeal of physical form.
- To help students identify and appreciate Architecture as an outcome of social and cultural processes of a geographical locality.
- To promote the visual literacy level and prepare to appreciate the aesthetic components of art and architecture.
- To analyse architectural grammar, styles and practices in various cultural settings

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand and:

- Write (simple) programs in Python to implement visually motivated solutions, viz., form generators.
- Become familiar with the scripting syntax, program flow, and geometry manipulation in Rhino.
- Model complex forms and relationships using geometric concepts and parametric tools.
- Model complex data flows toward desired design outcomes.
- Apply algorithmic thinking to design problems.
- Develop a sensibility for generative modelling.

PEDAGOGY

Through this course, students can start to pragmatically expand their basic knowledge in parametric design into generative design. The course consists of lectures, computer instruction and assignments. Softwares like Rhinoceros (version 6.0 or higher) and Grasshopper may be preferred.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	3	--	--	--	50	--	--	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Introduction Introduction to object-oriented programming and algorithmic thinking through the following Python language constructs: <ul style="list-style-type: none">• sequential, conditional, and loop statements• basic data types – strings, lists, tuples, and dictionaries• objects and classes• recursion and recursive functions• simple event-driven graphics program• simple form generators	8
2.	Generative geometry construction (Part 1) <ul style="list-style-type: none">• Customizing procedures for generative design via scripting and/or the use of specific plug-ins. The primary graphical scripting construct is the Grasshopper Python component, which takes inputs and produces graphical output, for purposes of display, modelling or making.	10
3.	Generative geometry construction (Part 2) <ul style="list-style-type: none">• Introduction to the basics of Rhino Common SDK , ways to handle geometry through the scripted development ,difference between the visual computing in Grasshopper and the scripted development , algorithms for geometric constructions based on o rule-based modelling by fractals, L-systems and grammars o simulation-based modelling by agents, swarm intelligence, evolutionary algorithms, genetic algorithms	12
4.	Rendition <ul style="list-style-type: none">• Translation of design and its application (Eg. Through 3D printed unit)	12

REFERENCE MATERIAL

1. Arturo Tedeschi, "AAD – Algorithms-Aided Design", Len Penseur Publisher, 2014.
2. Robert Woodbury, "Elements of Parametric Design", Routledge, 2010.
3. Helmut Pottmann, Andreas Asperl, Michael Hofer, and Axel Kilian, "Architectural Geometry", Bentley Institute Press, 2007.
4. Wassim Jabi, "Parametric Design for Architecture", Lawrence King Publishing, 2013.
5. Jinmo Rhee and Eddy Man Kim. Digital Media Series, Grasshopper. 2020

6. Rajaa Issa, "Essential Mathematics for Computational Design", Third Edition.
<http://www.rhino3d.com/download/rhino/5.0/EssentialMathematicsThirdEdition/>
Andrew Payne & Rajaa Issa,
7. The Grasshopper Primer – Third Edition
8. https://modelab.is/download/grasshopper-primer-third-edition-2/#pkg_10515_57c89cfd7be4d
9. Zubin Khabazi, Generative Algorithms.
<https://labdigifab.files.wordpress.com/2014/03/generative-algorithms.pdf>

ARCHITECTURAL INTERNSHIP/ PROFESSIONAL TRAINING			
Course Code	BAP 402	Credits	18
Contact Hours (Hrs/Week)	**	Semester	08
Course Category	HMC		

INTRODUCTION

To expose students to the daily realities of an architectural practice through Practical Training. The aim of the Professional Training is to enable the students to gain the kind and range of practical experience which will prepare them for their likely professional responsibilities, immediately after qualifying B. Arch. Course.

COURSE OBJECTIVES

- To enable an orientation that would include the process of development of conceptual ideas, presentation skills, involvement in office discussions, client meetings, development of the concepts into working drawings, tendering procedure, site supervision during execution and coordination with the agencies involved in the construction process.

PREREQUISITE

Relevant architectural drawing, presentation and design skills.

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able:

- To understand and apply the professional aspects of an architecture office/company and the multiple issues in conception, preparation and execution of project on a site.
- To learn to work on multiple projects in an office and learn all aspects relating to making of a building starting from Concept Development, Scheme Development, Presentation, Working Drawings, Specifications, Estimation etc. and through site visits
- To get exposed to practical aspects of making a building and other aspects like client meetings, project planning, project management and time management.

PEDAGOGY

Work assigned by the concerned office regularly documented through reports/ work logs etc.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIS	ETEP
0	18	0	--	Yes	--	35	--	15	-	--	50

CONTENT

S. No	Content	Contact Hours
1.	Practical Work – Part 1 Nature of works expected to be done during training: The architect may expose the trainee to difference aspects of professional practice. The task may include the following but not necessarily containing all. <ul style="list-style-type: none"> • Preparation of Sketch designs, presentation drawings etc. Municipal drawings according to the byelaws. • Workings drawings and details. Estimates, bill of quantities & specifications. Discussions with: Clients, Structural Consultants, Services Consultants. • Inspection and management of site. • Preparation of Models, perspectives and photographs. Preparation of Reports, progress charts etc. 	**
2.	Practical Work – Part 2 Other administrative works may include: <ul style="list-style-type: none"> • Critical Appraisal of a Building of National/International importance: • The trainee is required to write a report choosing any building that has been designed/ executed by the company/ firm, she / he is working for internship. This can be done through secondary research/data collection. The report should contain: <ul style="list-style-type: none"> • Explanation/ Justification for the choice of the project. • Fact file of the project- discussion on location, client profile, context (physical, cultural) and legal bindings. • Remarkable features that make the building / complex noteworthy. Trainee's own assessment and experience about the same. • References used in preparation of the appraisal. 	**
3.	Documentation of Professional Training Work- Component 1 <ul style="list-style-type: none"> • Regularly prepared and submitted documentation in the form of log books/ reports etc. as approved by the departmental authority 	**
4.	Documentation of Professional Training Work- Component 2 <ul style="list-style-type: none"> • Consolidated portfolio of training work in all parameters as fulfilled by the trainee during the stipulated tenure (as approved by the departmental authority) in the form of softcopy, portfolio and report or/ along with any other supporting deliverables as specified by the departmental authority. 	**

** The numbers of hours to be fulfilled per week would be as per the office requirements of the trainee where she is training. The number of weeks in the semester to be advised and decided by the departmental authority with a minimum of 14 contact weeks.