THIAGARAJAR COLLEGE OF ENGINEERING
(A Government Aided Autonomous Institution affiliated to Anna University)
MADURAI – 625 015

RULES AND REGULATIONS

For

M.Arch DEGREE PROGRAMME

For the students admitted from the academic year 2019-2020 onwards

THIAGARAJAR COLLEGE OF ENGINEERING, MADURAI - 625 015
(An Autonomous Institution affiliated to Anna University)

RULES AND REGULATIONS

M.ARCH. (GENERAL) DEGREE PROGRAMME

CHOICE BASED CREDIT SYSTEM
(These Rules and Regulations are applicable to the candidates admitted from the Academic year 2018 – 19 onwards)

1.0 PRELIMINARY DEFINITIONS AND NOMENCLATURE

In these Regulations, unless the context otherwise requires:

i. **"Programme"** means M. Arch Degree Programme

ii. "**Degree"** means Post Graduate (PG) Degree that is M.Arch degree.

iii. **"Course"** means a theory, or studio subject that is normally studied in a semester, like Contemporary Processes in Architectural Design, Urban Design Theories and Methodology, Integrated Architectural Design I, Dissertation etc.

iv. "**University**" means Anna University, Chennai.

2.0 QUALIFICATIONS FOR ADMISSION:

2.1. The candidates seeking admission to the programme shall require satisfying the eligibility norms prescribed by the Affiliating University and Director of Technical Education, Chennai, from time to time.

2.2. Candidates for admission for the first semester of the Post Graduate degree program shall be required to have passed an appropriate degree examination of Anna University (B. Arch./ AIIA *) or any other examination of any University or authority accepted by the Syndicate of the University as equivalent thereto.

*Candidates who have qualified with AIIA and registered with Council of Architecture only are eligible.

3.0 STRUCTURE OF PROGRAMME:

3.1 Categorization of Courses

M.Arch. Degree Programme shall have curriculum comprising of Theory courses and Studio Courses. The courses are categorized as follows:

i. **Programme Core Courses (PC)** are Studio courses relevant to the chosen specialization/branch.

ii. **Compulsory Foundation Courses (CFC) are theory** courses provide basic foundation to the core courses or supplement the core courses like Contemporary Processes in Architectural Design, Urban Design Theories and Methodology, Climate Change Adaptation and Resilience ,Research Methodology etc.

iii. **Elective Foundation Courses (EFC)** are theory courses which lead to knowledge enhancement selected from a pool of courses under specific streams like Sustainable water management, Urban Transport & Policy etc.

iv. **Programme Elective (PE)** are theory courses include the elective courses relevant to the chosen specialization/branch. The electives from the curriculum are to be chosen with the approval of the Head of Department.

A student may be permitted by the HOD to choose a maximum of one elective from other P.G. Programmes offered in the institution or in any one of the other departments of the University during the period of his /her study, provided the Head of the Department offering such a course also agrees and there is no clash in the time-table for the lecture classes.

The distribution of credits for each category is given Table 1.

Table1: Credit Distribution

S.No	Category	Credit Distribution
1.	Programme Core Courses	27
2	Compulsory Foundation Courses	24
3.	Elective Foundation Courses	9-12
4.	Programme Elective Courses	6-12
	Minimum Number of Credits to be earned for the award of the degree	66

3.2 The curriculum and syllabi of all the programmes shall be approved by the Board of Studies and Academic Council.

3.3 Credit Assignment

Each course is assigned certain number of credits based on the following:

Table 2: Credit Assignment

Contact period per week	Credit
1 hour Lecture Period	1
2 hours Tutorial Periods	1
2 hours Studio/ Practical Periods	1

3.4 Number of Courses/ Credits per semester

Curriculum of a semester shall normally have a blend of theory courses and studio courses. Each course may have credits assigned as per clause 3.3. However, the total number of courses per semester shall not exceed 5 of which the studio courses shall not exceed 2.

4.0 DURATION OF THE PROGRAMMES AND SEMESTERS:

4.1 The minimum period for completion of the Programme is 2 years (4 semesters) and maximum period for completion of the Programmes is 4 years (8 semesters).

4.2 The duration for the programmes shall extend over a period of four consecutive semesters for the candidates admitted in M.Arch. programmes

4.3 Each semester normally consists of 90 working days. In any contingent situation, the number of working days per semester shall not be less than 65 days. The Principal is given the discretionary power to decide the number of working days. The Principal shall ensure that every faculty member imparts instruction as per the number of periods specified in the syllabus and that the faculty teaches the full content of the specified syllabus for the course being taught.

4.4 For the purpose of regulations, the academic year will be normally divided into two semesters, the odd semester normally spanning from June to November and the even semester from December to May.

4.5 The courses in the curriculum of the Odd semesters will be conducted only in odd semesters and that of the even semesters only in even semesters.

5.0 COURSE REGISTRATION

5.1 Each student on regular admission has to register courses in the range between 18 and 27 credits, including the courses for which the student has done reappearance registration and supplementary examination.

5.2 A student has to earn the minimum number of total credits (66 Credits) specified in the curriculum of the chosen programme of study in order to be eligible to obtain the degree.

5.4 The registration for the courses of the Semesters II to IV will commence 2 days after the publication of result of the preceding semester. The student shall register for the courses with the guidance of the student's Faculty Mentor. If the student wishes, the student may drop or add courses (vide clause 5.1) within **five** working days after the commencement of the concerned semester and complete the registration process. The student is allowed to register for additional courses equivalent to the credit corresponding to the passed courses in revaluation.

5.5 No course shall be offered by a Department unless a minimum of 8 students register for that course.

5.6 After registering for a course, a student shall attend the classes, satisfy the attendance requirements (vide clause 6.1 and 6.2.1), earn continuous assessment marks and appear for the End Semester Examinations.

5.7 The student shall register for the Dissertation in the III semester and Thesis in the IV semester.

5.8 Reappearance Registration

5.8.1 If a student fails in a theory course, they shall do reappearance registration for that course in the subsequent semester by retaining the continuous assessment marks already earned.

5.8.2 a) If a student fails in Programme electives or Elective Foundation categories, he/she may register for the same course or any other course in the respective category. If a student registers for other course, he/she has to satisfy all the requirements in Clauses 6 and 9.

b) If a student is prevented to take the end semester viva-voce of a programme core course (Studio Courses) due to lack of attendance, the student cannot register for the programme core course of the subsequent semester until he registers for the course again when offered next, attend the classes & fulfill the attendance requirement as per clause 6.

c) The student who fails in any Programme Core Course (Studio Courses), his/her Continuous Assessment Marks is valid for only one subsequent attempt. After one subsequent attempt (clause 10.4.3) the student shall register for the same, when offered next, and repeat the course. In this case, the student shall attend the classes, satisfy the attendance requirements (vide clause 6), earn Continuous Assessment Marks and appear for the End Semester Viva -Voce Examinations. The facility of Reappearance Registration is not available for such courses.

5.8.3 If a student is prevented from taking the end semester examination of a course (theory / studio) due to lack of attendance, student has to register for that course again, when offered next, attend the classes and fulfil the attendance requirements as per clause 6.

If the course, in which student has lack of attendance, is a Programme Elective or an Elective Foundation Courses, student may register for same or other Programme Elective or Elective Foundation course respectively in the subsequent semesters.

5.8.4 A student who has already appeared for a course in a semester and passed the examination is not entitled to reappear the same course for improvement of Grade/Marks.

6.0 REQUIREMENTS FOR APPEARING FOR THE END SEMESTER EXAMINATION OF A COURSE

6.1 A student who has fulfilled the following conditions shall be deemed to be eligible to appear for the end semester examination.

Ideally, every student is expected to attend all the classes and earn 100% attendance. Students who have earned less than 75% attendance course wise taking into account the number of periods required for that course as specified in the curriculum will not be permitted to appear for End Semester Examination for that course.

- However, exemption may be given for the students who earned attendance between 65% and less than 75% in a particular course from the prescribed attendance requirement based on medical leave (hospitalization / accident / specific illness) and On Duty leave for participation in the College / University / State / National / International level Sports events (Vide clause 6.1.3) with prior approval from the Principal / competent authority. Such student shall be permitted to apply for condonation to the Principal through the respective Head of the Department. After the approval from the principal, the student shall be permitted to appear for the end semester examination for that course by paying the prescribed fee by the Controller of Examinations of the college. However, the students who have represented the college in NCC/NSS/Sports are exempted from the Condonation.
- His / her progress has been satisfactory and obtained bona fide certificate in the Record of all the Practical courses in the semester, and
- His / her conduct has been satisfactory.

6.1.1 A student shall be permitted to appear for the terminal examinations only if,

a. he/she satisfies the attendance requirements
b. the student's conduct has been satisfactory
c. he/she has paid the examination fees and registered for the examinations for all the courses of that semester by paying the prescribed examination fees within the due date. If any student fails to register and pay the examination fees within the due date, he /she shall not be permitted to attend the end semester examinations.
    - the prescribed fee by the Controller of Examinations of the college. However, the students who have represented the college in NCC/NSS/Sports are exempted from the Condonation.
    - His / her progress has been satisfactory and obtained bona fide certificate in the Record of all the Practical courses in the semester, and

6.1.2 The students who are consistently good in academics ONLY be considered for the grant of ODL under co-curricular / extra-curricular activities by the competent authorities. The following activities shall be considered for the award of ODL:

- Sports and Games: TIES, Inter collegiate, Inter Zonal, Inter University, State level, National level and Open Tournaments.
- NCC: Camps and expeditions, NSS camps
- Cultural Programs at State, National and International level
- Seminar / Symposia: Paper presentation / Quiz

- Leadership course organized by other organizations & Alumni Association activities, Association Activities, Placement Activities
  - NASA(National Association of Students of Architecture)
  - Zonal NASA Conventions.
- Training Programs/internship at Industries and Higher Learning Institutions
- Personal damages incurred during the extra-curricular activities.
- The ODL requisition letter shall be forwarded to the Principal through the Head of the Department of the student by the staff-in-charge of the respective activities before completion of every activity.
- The ODL sanctioned letters shall be submitted to the Department office. The faculty-in-charge of the department office will check the eligibility for the award of attendance at the end of semester and the same may be submitted to the Head of the Department for approval.

7.0 FACULTY MENTOR

To help the students in planning their courses of study and for general advice on the academic programme, the Head of the Department will assign a faculty member of the Department to each year. He /she shall function as Faculty Advisor for these students throughout their period of study. The faculty advisor shall

- Advise the students in registering and reappearance registering of courses
- Monitor their attendance, academic progress and discipline of the students
- Counsel periodically or during the Faculty Advisor/Tutor/Proctor-ward meeting scheduled in the class time table.
- Inform the students about the various facilities and activities available to enhance the student's curricular and co-curricular activities.
- If necessary, the faculty mentor may also discuss with or inform the parents about the progress of the students through the Head of the Department or in the parent –teacher meeting.

8. 0 ACADEMIC COMMITTEES

8.1 Class Committee

Every class shall have a class committee consisting of faculty members handling courses of the concerned class, student representatives – cross section of students (Academically good, average, Poor) and a chairperson who is a faculty not handling the course for the class. The overall goal is to improve the teaching-learning process. The functions of the class committee include:

- Solving problems experienced by students in the classroom and in the laboratories.
- Clarifying the regulations of the degree programme and the details of rules therein.

- Informing the student representatives the academic schedule including the dates of assessments (Tests & Assignments) and the syllabus coverage for each assessment.
- Analyzing the performance of the students of the class after each test and finding the ways and means of solving problems, if any
- Identifying the weak students, if any, and requesting the faculty concerned to provide some additional help or guidance or coaching to such weak students.

8.2 The class committee for a class is constituted by the Head of the department.

8.3 The class committee shall be constituted on the first day of commencement of any semester.

8.4 At least 3 student representatives shall be included in the class committee.

8.5 The chairperson of the class committee may invite the Tutor(s) and the Head of the department to the meeting of the class committee.

8.6 The Principal may participate in any class committee of the institution.

8.7 The chairperson is required to prepare the minutes of every meeting, submit the same to Head of the Department within two working days of the meeting and arrange to circulate among the concerned students and faculty members. If there are some points in the minutes requiring action by the management, the same shall be brought to the notice of the management by the Principal.

8.8 The class committee shall meet three times a semester:

- The first meeting within a week from the date of commencement of the semester.
- The second meeting a week after the first test results.
- The third meeting a week before the last lecture day of the semester.

8.9 During these meetings the student members representing the entire class, shall meaningfully interact and express the opinions and suggestions of the other students of the class to improve the effectiveness of the teaching-learning process.

9.0 SYSTEM OF EXAMINATION:

9.1 M.Arch. Programme consists of Theory Courses and Studio Courses.

Performance in each course of study shall be evaluated based on (i) Continuous Assessments throughout the semester and (ii) End Semester Examination at the end of the semester.

For Theory courses including Programme elective courses and Elective Foundation Courses, out of 100 marks, the maximum marks for Continuous Assessment is 50 and the End Semester Terminal Examination will be conducted for 100marks which will be reduced to 50 marks.

For studio Courses out of 100 marks, the maximum marks for Continuous Assessment is 60 and the End Semester Viva Voce Examination will be conducted for 100marks which will be reduced to 40 marks.

The maximum marks assigned to different courses shall be as given in Table 3.

Table 3: Assessment Pattern

S. No	Categorization of courses	Continuous Assessment	End Semester Examinations/Viva	Total marks
1.	Theory Courses	50	50	100
2.	Studio Courses	60	40	100

9.2 Assessment for Theory Courses

Theory courses

Continuous Assessment comprises of two assessments, conducted by the course instructor / coordinator / department. One assessment will be in the form of internal test. The total marks obtained in the test and the assignment put together shall be reduced to 50.

The apportioning of marks shall be as follows:

- 30 marks for test
- 20 marks for assignments/tutorials/seminars/mini projects/site study/ field visit report / working model / evaluation report / test report / drawings/construction yard exercises etc.

A minimum of two tests would be conducted in a day (in the case of tests and they would be of two hours durations each) students will not have regular classes on the scheduled day of these tests. In case a **student misses** the assessment due to medical reasons (hospitalization / accident / specific illness) or due to participation in the College / University / State / National / International level Sports events with prior permission and approval from the Head of the Department within one week, **Re test / Assignment submission** may be given through the concerned course instructor.

9.3 Assessment for Dissertation

Every candidate shall submit at the end of the II semester a topic approved by a Dissertation review committee, which shall comprise of the Dissertation Coordinator, Supervisor and one External member/Visiting faculty, constituted by the Head of the Department. The dissertation shall be evaluated for 60 marks by the Dissertation review committee, through continuous assessment with a minimum of 4 reviews (including one topic selection review which will not be evaluated) throughout the semester. The External Review member /Visiting faculty will be appointed by the Controller of Examination from a panel recommended by the Head of the Department.

9.4 Assessment for Studio Courses

The Continuous Assessment evaluation for Studio Courses will be carried out for 60 marks for the performance of the candidate in the studio projects throughout the semester. The number of projects and evaluation weightage for the studio projects shall be discussed and recommended by the Department Committee constituted by the Head of the Department.

9.5 Assessment for Architectural Thesis

Every candidate shall submit a synopsis at the end of III Semester to be approved by the Department Committee constituted by the Head of the Department. The thesis review committee constituted by the Head of the Department shall comprise of the Coordinator of the Thesis, one internal member, the Supervisor and minimum of one External member/Visiting faculty. The Thesis shall be evaluated for 60 marks by the Thesis review committee through continuous assessment with a minimum of 4 reviews (including one topic selection review which will not be evaluated) throughout the semester. The External Review members/Visiting faculty will be appointed by the Controller of Examination from a panel recommended by the Head of the Department.

9.6 Assessment for Guided Study Course

The syllabus of the course and mode of assessments shall be approved by the Department Committee constituted by the Head of the Department, Academic Council and forwarded to the Controller of Examinations before the commencement of the semester. One Faculty member approved by the Head of the Department shall be responsible for the periodic monitoring and evaluation of the course.

9.7 Students are prohibited from entering into the Examination Hall / Laboratories with any book or portion of book, manuscript, or paper of any description or Communicating with or copying from each other or communicating with anyone outside the Examination Hall / Laboratories. Programmable calculator and mobile phone shall not be permitted inside the Examination hall / Laboratories. However, any required codebooks and data sheets / books as specified in the question paper will be supplied inside the Examination hall / laboratories by the office of the Controller of Examinations. The students are warned that any form of Malpractice will be dealt with severely. The punishment may be cancelling all the examinations registered by the student in that semester and debarring permanently from all the examinations and disciplinary action will be taken by the college authorities after conducting enquiry. Identity card of the college must be produced at the time of terminal examination. Any student fails to produce Identity card shall not be permitted to appear for the examination.

9.8 A student can apply for revaluation of his/her semester examination answer paper in theory within a week from the declaration of results, on payment of a prescribed fee through proper application to the Controller of Examinations. The Controller of Examination will arrange for the revaluation and the results will be published before the commencement of supplementary examinations. Revaluation is not permitted for practical courses, project work and industry supported courses.

9.9 Students can go through the answer script for re-totaling before they apply for revaluation after the publication of the results.

9.10 A student can apply for revaluation of his/her semester examination answer paper in theory within a week from the declaration of results, on payment of a prescribed fee through proper application to the Controller of Examinations. The Controller of Examination will arrange for the revaluation and the results will be published before the commencement of supplementary examinations.

9.11. Revaluation is not permitted for Studio Courses.

10.0 ELIGIBILITY FOR PASS IN EACH COURSE

The Passing requirement for a student in a course is determined statistically based on the analysis of the marks obtained both in Continuous Assessment and End Semester Examinations put together.

10.1 Theory Courses

10.1.1 For theory courses a candidate shall be declared to have passed the examination, if he / she secures minimum of 25 marks out of 50 in the end semester terminal examination with a minimum aggregate of 50 marks in continuous assessment and end semester examination put together.

10.1.2 If a student fails to secure a pass in a theory course the continuous assessment marks already earned will be retained for subsequent reappearances.

10.4 Studio Courses

10.4.1 For studio courses, a candidate shall be declared to have passed the examination if he / she secure an aggregate of 50 marks out of 100 obtained in the Continuous Assessment and End semester examination put together. The End Semester Examination will be conducted as Viva-Voce for the portfolio submitted by the candidate.

10.4.2 For Architectural Thesis, a candidate shall be declared to have passed if he / she secures an aggregate of 50 marks of the total of 100 marks in the Continuous Assessment and the End Semester Viva Voce examination put together. Attending the End Semester Viva Voce examination is compulsory.

10.4.3 If a student fails to secure a pass in examinations of studio courses, the student shall resubmit an improved portfolio/works/sheets for the subsequent viva voce examination conducted in the following semester. The continuous assessment marks shall be valid for one subsequent attempt.

In case, a student fails to secure a pass in the subsequent attempt also, in the studio courses, the student shall repeat when the course is offered next, secure fresh continuous assessment and submit the portfolio/works/sheets as in the case of a regular student.

10.5 Award of Grades

Range of Total Marks (TM) (Continuous assessment +Terminal Examination)	Letter Grade	Grade Point (GP)
$90 \leq TM \leq 100$	S	10
$80 \leq TM < 90$	A	9
$70 \leq TM < 80$	B	8
$60 \leq TM < 70$	C	7
$50 \leq TM < 60$	D	6
$0 \leq TM < 50$	U	0
Non-completion of a semester(Repeat course)	I	0
Withdrawal from terminal examination	W	0
Absent	AA	0

$$GPA = \frac{\sum_{i=1}^{N} C_i GP_i}{\sum_{i=1}^{N} C_i}$$

N is the number of all courses to be registered in the particular semester, GP_i is the grade point obtained in i^{th} course and C_i is the number of credits assigned to i^{th} course. Cumulative GPA (CGPA) will be calculated when the student is declared to be eligible for the award of the degree. CGPA calculation is based on all the courses considered (vide clause 5.2) for the award of the degree.

11.0 REQUIREMENTS FOR MOVING TO A HIGHER SEMESTER

11.1 A student of the M.Arch. shall move to the higher semester if student satisfies Semester completion requirements (vide clause -6) and the following conditions.
To move to:

(i) III semester, a pass is required in - Integrated Architectural Design I (Sem I)
(ii) IV semester, a pass is required in - Integrated Architectural Design II (Sem II)

11.2 A student shall move to the next higher semester if the student has satisfied the Semester completion requirements (vide Clause 6).

12.0 ISSUE OF GRADE CARD

12.1 The grade card will be issued, through the head of the department every semester after the publication of results up to prefinal semester and a consolidated grade card will be issued after successful completion of all the courses and eligible for the award of degree. The grade card will contain the following information:

i. The courses for which credits are earned with Course code and title
ii. Grade obtained in each course
iii. Cumulative grade point average earned during the course
iv. Month and year of successful appearance

13.0 ELIGIBILITY FOR THE AWARD OF DEGREE

A student shall be declared to be eligible for the award of the M.Arch. Degree provided the student has

(a) A student seeking M.Arch degree shall be required to undergo the **prescribed** courses of study and evaluation in the college for the specified duration and to pass all the examinations prescribed therefore.

(b) He/ she should enrol for all the courses prescribed in the curriculum of the respective degree programme and earn the minimum number of credits (66 credits).

(c) The maximum time limit for the completion of the M.Arch Degree programmes will be 4 (FOUR) years from the date of admission to the first semester of the programme

(d) No disciplinary action pending against the student

14.0 CLASSIFICATION OF THE DEGREE AWARDED

14.1. **First class with Distinction**

A student who qualifies for the award of degree (vide clause 13.0) having passed the examination in all registered courses in his / her first appearance, within THREE years including the authorized Break of Study of One Year, and securing a CGPA of not less than 8.50 shall be declared to have passed in First class with distinction and should not have been prevented from writing end semester examination due to lack of attendance in any of the courses. The authorized break of study (vide clause 15.0) and withdrawal from the examination (vide clause 16.0) will not be counted as an attempt.

14.2. **First Class**

A student who qualifies for the award of degree (vide clause 13.0) having passed the examination in all the courses within THREE years including the authorized Break of Study of One Year and securing a CGPA of not less than 7.00 shall be declared to have passed in First class and should not have been prevented from writing end semester examination due to lack of attendance in any of the courses. The authorized break of study (vide clause 15.0) and withdrawal from the examination (vide clause 16.0) will not be counted as an attempt.

14.3. **Second Class**

All other students (not covered in 14.1 and 14.2) who qualify for the award of degree having passed the examination in all the courses and fulfilling the requirements given in clause 13.0 above shall be declared to have passed in Second Class.

A student who is absent for end semester examination in a course / Architecture Thesis after having registered for the same shall be considered to have appeared in that (except approved withdrawal from end semester examination) for the purpose of classification.

15.0 TEMPORARY BREAK OF STUDY FROM A PROGRAMME

15.1. A student is not normally permitted to break the study temporarily. However, if a student intends to temporarily discontinue the programme in the middle for valid reasons (such as accident or hospitalization due to prolonged ill health) and to rejoin the programme, he/she shall apply in advance to The Principal, through the Head of the Department stating the

reasons, in any case, not later than the last lecture day, provided he/she fulfills the requirement in Clause 6.0.

15.2 The student permitted to rejoin the programme after the break shall be governed by the rules and regulations in force at the time of rejoining.

15.3 The duration specified for passing all the courses for the purpose of classification vide Clause 14.1 and 14.2 shall be increased by the period of such break of study permitted.

15.4 The total period for completion of the programme reckoned from the commencement of the first semester to which the student was admitted shall not exceed the maximum period specified in clause 13.0 irrespective of the period of break of study in order that he/she may be eligible for the award of the degree.

15.5 If any student is detained for want of requisite attendance, progress and good conduct, the period spent in that semester shall not be considered as permitted 'Break of Study'.

16. 0 PROVISION FOR WITHDRAWAL FROM THE EXAMINATIONS

16.1 A student will be permitted to withdraw in any one of the semesters except first semester during the entire duration of the degree programme for valid and genuine reasons by making an application in the office of the Controller of Examinations through the respective Head of the Department for withdrawal at least one day in advance of the last theory examination in that semester. When he / she appear subsequently, he / she have to appear for all the courses of that semester on registration and payment of fees. Subsequent appearance will not be counted as separate attempt.

16.2 Those students who withdraw are eligible for the award of First Class and First Class with Distinction as per the requirement in this regard. However he / she will not be considered for ranking.

16.3 Withdrawal is permitted ONLY ONCE during the entire duration of the degree programme.

16.4. Withdrawal is not permitted to the student who has not satisfied the conditions prescribed in clause 6.0 as requirements for appearing in the end semester examination.

16.5. Withdrawal is permitted for the end semester examinations in the final semester only if the period of study the student concerned does not exceed 5 years as per clause 14.1.

17.0 DISCIPLINE

17.1 Every student is required to observe discipline and decorous behavior both inside and outside the college and not to indulge in any activity, which will tend to bring down the prestige of the college. The Principal shall constitute a disciplinary committee to enquire into acts of indiscipline and notify the institution about the disciplinary action recommended for approval. In case of any serious disciplinary action which leads to suspension or dismissal, then a special committee shall be constituted by the Head of the Institution for taking the final decision.

17.2 If a student indulges in malpractice in any of the Examinations, the student shall be liable for punitive action as prescribed by the College from time to time.

18.0 REVISION OF REGULATIONS AND CURRICULUM

The standing committee/Academic Council of the College reserves the right to revise or change or amend the regulations, the scheme of examinations, the curriculum and the syllabi from time to time if found necessary.

19.0 SPECIAL CASES

In the event of any clarification in the interpretation of the above rules and regulations, they shall be referred to the Standing Committee. The Standing Committee will offer suitable interpretations/ clarifications /amendments required for special case on such references and get them ratified in the next meeting of the Academic Council. The decision of the Academic Council is final.

THIAGARAJAR COLLEGE OF ENGINEERING

(A Government Aided Autonomous Institution affiliated to Anna University)

MADURAI – 625 015

CURRICULUM AND DETAILED SYLLABI

For

M.Arch DEGREE PROGRAMME

For the students admitted from the academic year 2018-2019 onwards

Department of Architecture, Thiagarajar College of Engineering, Madurai – 625015
(For the candidates admitted from 2018-2019)
Scheduling of Courses

<table>
<tr><th>SEM</th><th colspan="4">THEORY</th><th>STUDIO</th></tr>
<tr><td></td><td colspan="4">Compulsory Foundation Courses</td><td>Programme Core Courses</td></tr>
<tr><td>I</td><td>18GA110
Contemporary Processes in Architectural Design</td><td>18GA120
Urban Design Theories and Methodology</td><td>18GA130
Climate Change Adaptation and Resilience</td><td>18GA140
Structures and Services for Mega Buildings</td><td>I8GA150
Integrated Architectural Design I (6)</td></tr>
<tr><td></td><td colspan="2">Compulsory Foundation Courses</td><td>Elective Foundation Courses</td><td>Programme Elective</td><td></td></tr>
<tr><td>II</td><td>18GA210
Research Methodology</td><td>18GA220
Urban Renewal and Conservation</td><td rowspan="3">**Credits are to be earned

Elective foundations that could be chosen are as in Annex1</td><td rowspan="3">**Credits are to be earned

Program Elective that could be chosen are as in Annex 1</td><td>I8GA230
Integrated Architectural Design II (6)</td></tr>
<tr><td>III</td><td>18GA310
Contemporary Architectural Trends</td><td>18GA320
Urban Ecology</td><td>I8GA330
Dissertation (5)</td></tr>
<tr><td>IV</td><td colspan="2"></td><td>I8GA410
Architectural Thesis (10)</td></tr>
</table>

Program Core Courses+ Compulsory Foundation Courses =27+ 24 =51 credits; ** Elective Foundation Courses + Program Elective = 9(min) to12 (max) +6(min) to (12Max) =15(min) to 24(max) credits;

TOTAL CREDITS = 66 CREDITS MINIMUM

THIAGARAJAR COLLEGE OF ENGINEERING, MADURAI- 625 015
(A Govt. Aided Autonomous Institution affiliated to Anna University)
SUBJECTS OF STUDY
CHOICE BASED CREDIT SYSTEM

Annexure – I

Degree: M. Arch **Programme: General Architecture**

Compulsory Foundation Courses: **Total Credits to be earned: 24**

a. Architecture

S. No	Course Code	Name of the Course	Number of Hours / Week			Credit	Semester/ Pre-Requisite
			L	T	P		
THEORY							
1.	18GA110	Contemporary Processes in Architectural Design	3	-	-	3	I SEM ONLY
2.	18GA120	Urban Design Theories and Methodology	3	-	-	3	I SEM ONLY
3.	18GA130	Climate Change Adaptation and Resilience	3	-	-	3	I SEM ONLY
4.	18GA140	Structures and Services for Mega Buildings	3	-	-	3	I SEM ONLY
5.	18GA210	Research Methodology	3	-	-	3	II SEM ONLY
6.	18GA220	Urban Renewal and Conservation	3	-	-	3	II SEM ONLY
7.	18GA310	Contemporary Architectural Trends	3	-	-	3	III SEM ONLY
8.	18GA320	Urban Ecology	3	-	-	3	III SEM ONLY

2. Programme Core Courses: **Total Credits to be earned: 27**

S.No	Course Code	Name of the Course	Number of Hours / Week			Credit	Semester/ Pre-Requisite
			L	T	P		
STUDIO							
1.	I8GA150	Integrated Architectural Design I	-	-	12	6	I SEM
2.	I8GA230	Integrated Architectural Design II	-	-	12	6	II SEM
3.	I8GA330	Dissertation	-	-	10	5	III SEM
4.	I8GA410	Architectural Thesis	-	-	20	10	IV SEM

3. Elective Foundation Courses: **Minimum Credits to be earned: 9**

a. Architecture

S. No	Course Code	Name of the Course	Number of Hours / Week			Credit	Semester Pre-Requisite
			L	T	P		
THEORY							
1.	18GAFA0	Computer Applications in Architecture	3	-	-	3	II SEM AND ABOVE
2.	18GAFB0	Sustainable Water Management	3	-	-	3	II SEM AND ABOVE
3.	18GAFC0	Urban Transport and Policy	3	-	-	3	II SEM AND ABOVE
4.	18GAFD0	Emerging Practices in Housing	3	-	-	3	II SEM AND ABOVE
5.	18GAFE0	Lighting Design for Work Environment	3	-	-	3	II SEM AND ABOVE
6.	18GAFF0	Landscape Construction	3	-	-	3	II SEM AND ABOVE
7.	18GAFG0	Architectural Pedagogy	3	-	-	3	II SEM AND ABOVE

4. Programme Elective Courses: **Minimum Credits to be earned:6**

S. No	Course Code	Name of the Course	Number of Hours / Week			Credit	Semester/ Pre-Requisite
			L	T	P		
THEORY							
1.	18GAPA0	Disaster Mitigation and Management	3	-	-	3	II SEM AND ABOVE
2.	18GAPB0	Digital tools for Environmental Architecture	3	-	-	3	II SEM AND ABOVE
3.	18GAPC0	Design Research and Field Studies	3	-	-	3	II SEM AND ABOVE
4.	18GAPD0	Architecture and Critical Theory	3	-	-	3	II SEM AND ABOVE
5.	18GAPE0	Project Management	3	-	-	3	II SEM AND ABOVE
6.	18GAPF0	Intellectual Property Rights	3	-	-	3	II SEM AND ABOVE

THIAGARAJAR COLLEGE OF ENGINEERING, MADURAI- 625 015
(A Govt. Aided Autonomous Institution affiliated to Anna University)

SCHEME OF EXAMINATIONS

(For the candidates admitted from 2018-2019 onwards)

Annexure – II

Degree: M. Arch **Programme: General Architecture**

FIRST SEMESTER

S.NO	Sub. Code	Name of the Subject	Duration of Terminal Exam. [in Hours]	Max. Marks				Min. Marks for Pass			
				Continuous assessment* (A)	Terminal Exam (B)		Max. Marks (A + B)	Continuous assessment (A)	Terminal Exam (B)		Total (A + B)
					Written test	Viva voce			Written test	Viva voce	
THEORY ^											
1	18GA110	Contemporary Processes in Architectural Design	3	50	50^	-	100	-	25	-	50
2	18GA120	Urban Design Theories and Methodology	3	50	50^	-	100	-	25	-	50
3	18GA130	Climate Change Adaptation and Resilience	3	50	50^	-	100	-	25	-	50
4	18GA140	Structures and Services for Mega Buildings	3	50	50^	-	100	-	25	-	50
STUDIO#											
5	I8GA150	Integrated Architectural Design I	-	60	-	40#	100	-	-	-	50

*** Continuous** Assessment Evaluation pattern will differ from subject to subject

^ For Theory courses Terminal Examination will be conducted for maximum marks of 100 and subsequently be reduced to 50 marks for the award of terminal examination marks.

For Studio Courses, Terminal Examination in the form of Viva voce will be conducted during the end semester for a maximum of 100 marks and subsequently be reduced to 40 marks for the award of terminal examination marks.

SECOND SEMESTER

S.NO	Sub. Code	Name of the Subject	Duration of Terminal Exam. [in Hours]	Max. Marks				Min. Marks for Pass			
				Continuous assessment* (A)	Terminal Exam (B)		Max. Marks (A + B)	Continuous assessment (A)	Terminal Exam (B)		Total (A + B)
					Written test	Viva voce			Written test	Viva voce	
THEORY ^											
1	18GA210	Research Methodology	3	50	50^	-	100	-	25	-	50
2	18GA220	Urban Renewal and Conservation	3	50	50^	-	100	-	25	-	50
STUDIO#											
3	I8GA230	Integrated Architectural Design II	-	60	-	40#	100	-	-	-	50

*** Continuous** Assessment Evaluation pattern will differ from subject to subject

^ For Theory courses Terminal Examination will be conducted for maximum marks of 100 and subsequently be reduced to 50 marks for the award of terminal examination marks.

For Studio Courses, Terminal Examination in the form of Viva voce will be conducted during the end semester for a maximum of 100 marks and subsequently be reduced to 40 marks for the award of terminal examination marks.

THIRD SEMESTER

S.NO	Sub. Code	Name of the Subject	Duration of Terminal Exam. [in Hours]	Max. Marks				Min. Marks for Pass			
				Continuous assessment* (A)	Terminal Exam (B)		Max. Marks (A + B)	Continuous assessment (A)	Terminal Exam (B)		Total (A + B)
					Written test	Viva voce			Written test	Viva voce	
THEORY ^											
1	18GA310	Contemporary Architectural Trends	3	50	50^	-	100	-	25	-	50
2	18GA320	Urban Ecology	3	50	50^	-	100	-	25	-	50
STUDIO#											
3.	I8GA330	Dissertation	-	60	-	40#	100	-	-	-	50

*** Continuous** Assessment Evaluation pattern will differ from subject to subject

^ For Theory courses Terminal Examination will be conducted for maximum marks of 100 and subsequently be reduced to 50 marks for the award of terminal examination marks.

For Studio Courses, Terminal Examination in the form of Viva voce will be conducted during the end semester for a maximum of 100 marks and subsequently be reduced to 40 marks for the award of terminal examination marks.

FOURTH SEMESTER

S.NO	Sub. Code	Name of the Subject	Duration of Terminal Exam. [in Hours]	Max. Marks				Min. Marks for Pass			
				Continuous assessment* (A)	Terminal Exam (B)		Max. Marks (A + B)	Continuous assessment (A)	Terminal Exam (B)		Total (A + B)
					Written test	Viva voce			Written test	Viva voce	
STUDIO#											
1.	I8GA410	Architectural Thesis	-	60	-	40#	100	-	-	-	50

*** Continuous** Assessment Evaluation pattern will differ from subject to subject

For Studio Courses, Terminal Examination in the form of Viva voce will be conducted during the end semester for a maximum of 100 marks and subsequently be reduced to 40 marks for the award of terminal examination marks.

ELECTIVE FOUNDATION COURSES

S.NO	Sub. Code	Name of the Subject	Duration of Terminal Exam. [in Hours]	Max. Marks				Min. Marks for Pass			
				Continuous assessment* (A)	Terminal Exam (B)		Max. Marks (A + B)	Continuous assessment (A)	Terminal Exam (B)		Total (A + B)
					Written test	Viva voce			Written test	Viva voce	
THEORY ^											
1.	18GAFA0	Computer Applications in Architecture	3	50	50^	-	100	-	25	-	50
2.	18GAFB0	Sustainable Water Management	3	50	50^	-	100	-	25	-	50
3.	18GAFC0	Urban Transport and Policy	3	50	50^	-	100	-	25	-	50
4.	18GAFD0	Emerging Practices in Housing	3	50	50^	-	100	-	25	-	50
5.	18GAFE0	Lighting Design for Work Environment	3	50	50^	-	100	-	25	-	50
6.	18GAFF0	Landscape Construction	3	50	50^	-	100	-	25	-	50
7	18GAFG0	Architectural Pedagogy	3	50	50^	-	100	-	25	-	50

***** Continuous Assessment Evaluation pattern will differ from subject to subject.

^ For Theory courses, Terminal Examination will be conducted for maximum marks of 100 and subsequently be reduced to 50 marks for the award of terminal examination marks.

PROGRAMME ELECTIVE COURSES

S.NO	Sub. Code	Name of the Subject	Duration of Terminal Exam. [in Hours]	Max. Marks				Min. Marks for Pass			
				Continuous assessment* (A)	Terminal Exam (B)		Max. Marks (A + B)	Continuous assessment (A)	Terminal Exam (B)		Total (A + B)
					Written test	Viva voce			Written test	Viva voce	
THEORY ^											
1.	18GAPA0	Disaster Mitigation and Management	3	50	50^	-	100	-	25	-	50
2.	18GAPB0	Digital tools for Environmental Architecture	3	50	50^	-	100	-	25	-	50
3.	18GAPC0	Design Research and Field Studies	3	50	50^	-	100	-	25	-	50
4.	18GAPD0	Architecture and Critical Theory	3	50	50^	-	100	-	25	-	50
5.	18GAPE0	Project Management	3	50	50^	-	100	-	25	-	50
6.	18GAPF0	Intellectual Property Rights	3	50	50^	-	100	-	25	-	50

^ For Theory courses Terminal Examination will be conducted for maximum marks of 100 and subsequently be reduced to 50 marks for the award of terminal examination marks

COMPULSORY FOUNDATION COURSES
A. ARCHITECTURE
(THEORY)

18GA110	CONTEMPORARY PROCESSES IN ARCHITECTURE DESIGN	Category	L	T	P	C
		CFC	3	0	0	3

Preamble

The course deals with the contemporary theories of media and their influence on the perception of space and architecture. The course focuses on various contemporary design processes and its relation to computation.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Understanding of the effect of contemporary theories of media on contemporary architectural design.	**Understand**
CO2	Understanding of various contemporary design processes and their relation to computation.	**Understand**
CO3	Analyzing the effect of contemporary theories of media on contemporary architectural design through detailed case studies of contemporary architects.	**Analyse**
CO4	Analyse and interpret the various contemporary design processes and their relation to computation.	**Analyse**
CO5	Analyse the relationship between design intent and design response using parametric tools.	**Analyse**
CO6	Acquire knowledge on various contemporary theories of media and analysing its effectiveness in architectural design/ design process.	**Analyse**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	L	L	L
CO2	S	L	L	L
CO3	S	L	L	M
CO4	S	L	L	L
CO5	S	M	M	M
CO6	S	M	M	M

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Understand	**20**	**20**
Analyse	**80**	**80**

Course Level Assessment Questions

Course Outcome 1 (CO1)

1. List the aspects of Digital architecture.
2. Brief your understanding on augmented reality.
3. Differentiate between physical and virtual realm.

Course Outcome 2 (CO2)

1. Write about the complex nature of Design process.
2. What do you understand by generative design methodology?

Course Outcome 3 (CO3)

1. Choose any contemporary architect whose design is influenced by digital media and critically analyse his building and design process.
2. Briefly discuss about the ideas and works of Greg Lynn.

Course Outcome 4 (CO4)

1. Examine the role of 'Diagrams" in Architectural design process.
2. Explain in detail about Genetic algorithm and design computation.

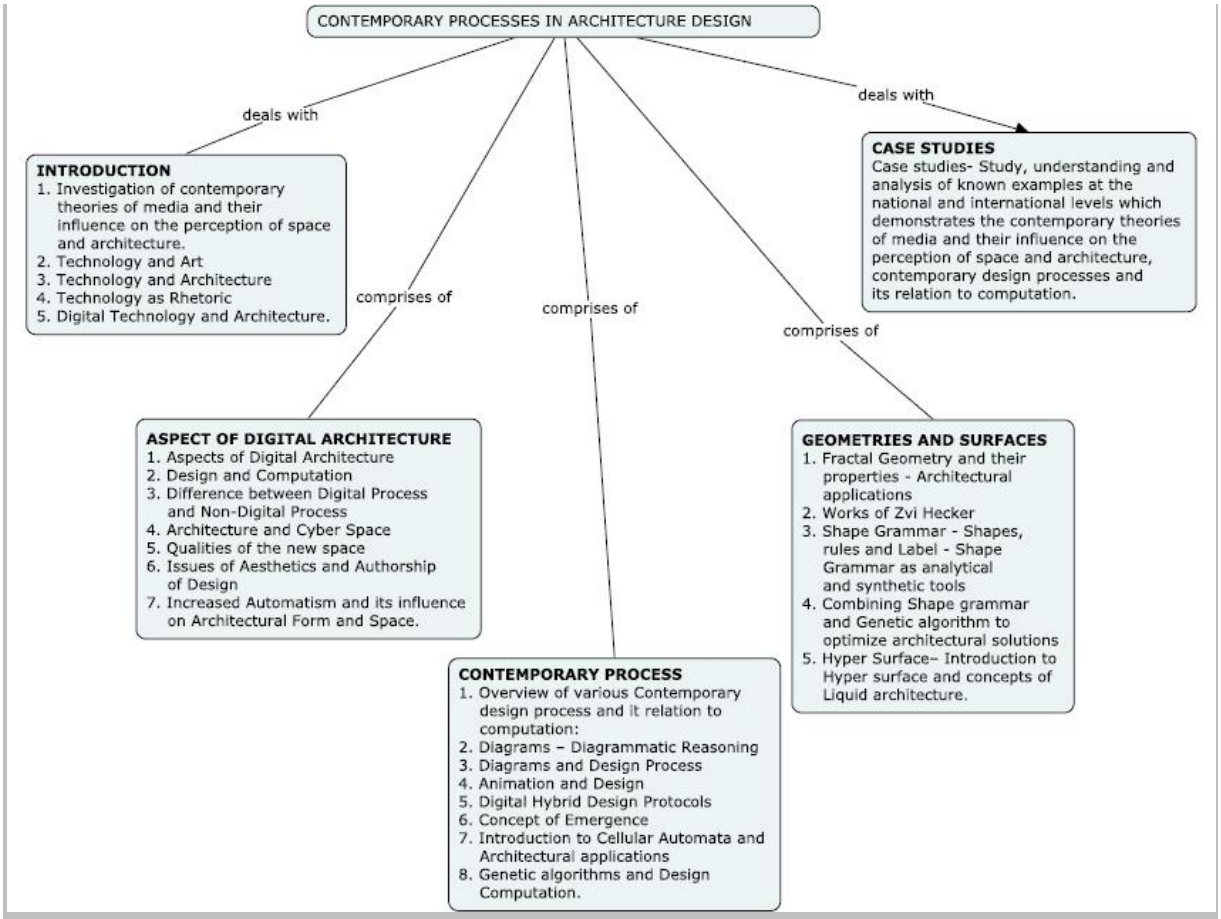
Course Outcome 5 (CO5)

1. Explain and analyse in detail about shape grammars.
2. Write about the 6 digital phenomena that affect the architectural world.

Course Outcome 6 (CO6)

1. Compare and contrast non digital conventional methods and Digital methods of designing Architecture with examples.

Concept Map



Syllabus

INTRODUCTION - Investigation of contemporary theories of media and their influence on the perception of space and architecture. Technology and Art – Technology and Architecture – Technology as Rhetoric – Digital Technology and Architecture. **ASPECT OF DIGITAL ARCHITECTURE** - Aspects of Digital Architecture – Design and Computation – Difference between Digital Process and Non-Digital Process – Architecture and Cyber Space – Qualities of the new space – Issues of Aesthetics and Authorship of Design – Increased Automatism and its influence on Architectural Form and Space. **CONTEMPORARY PROCESS** - Overview of various Contemporary design process and it relation to computation: Diagrams – Diagrammatic Reasoning – Diagrams and Design Process – Animation and Design – Digital Hybrid Design Protocols – Concept of Emergence - Introduction to Cellular Automata and Architectural applications – Genetic algorithms and Design Computation. **GEOMETRIES AND SURFACES** - Fractal Geometry and their properties – Architectural applications - Works of Zvi Hecker – Shape Grammar - Shapes, rules and Label - Shape Grammar as analytical and synthetic tools- Combining Shape grammar and Genetic algorithm to optimize architectural solutions - Hyper Surface– Introduction to Hyper surface and concepts of Liquid architecture. **CASE STUDIES** Case studies- Study, understanding and analysis of known examples at the national and international levels which demonstrates the contemporary theories of media and their influence on the perception of space and architecture, contemporary design processes and its relation to computation.

References

1. Peter Eisenmann, Diagram: An Original Scene of Writing, Diagram Diaries
2. MOVE, UN Studio
3. Grey Lynn, The Folded, The Pliant and The Supple, Animate form
4. Contemporary Techniques in Architecture, Halsted Press, 2002
5. Ali Rahim, Contemporary Process in Architecture, John Wiley & Sons, 2000.
6. Walter Benjamin, Practices of Art in the Age of Mechanical Reproduction Colin press, 1977
7. Work of Architecture in the Age of Mechanical Reproduction, Differences MIT press,1997.
8. William J Mitchell, the Logic of Architecture: Design, Computation and Cognition. MIT Press, Cambridge, 1995
9. Marcos Novak, invisible Architecture: An Installation for the Greek Pavilion, Venice Biennale, 2000.

Course Contents and Lecture Schedule

S.No.	Topic	No. of lectures
1	**INTRODUCTION**	**4**
1.1	Investigation of contemporary theories of media and their influence on the perception of space and architecture.	2
1.2	Technology and Art – Technology and Architecture – Technology as Rhetoric – Digital Technology and Architecture	2
2	**ASPECT OF DIGITAL ARCHITECTURE**	**9**
2.1	Aspects of Digital Architecture – Design and Computation – Difference between Digital Process and Non-Digital Process	3
2.2	Architecture and Cyber Space – Qualities of the new space	2
2.3	Issues of Aesthetics and Authorship of Design	2
2.4	Increased Automatism and its influence on Architectural Form and Space	2
3	**CONTEMPORARY PROCESS**	**12**
3.1	Overview of various Contemporary design process and it relation to computation:	1
3.2	Diagrams – Diagrammatic Reasoning – Diagrams and Design Process	3
3.3	Animation and Design – Digital Hybrid Design Protocols – Concept of Emergence	3
3.4	Introduction to Cellular Automata and Architectural applications	2
3.5	Genetic algorithms and Design Computation	3
4	**GEOMETRIES AND SURFACES**	**10**
4.1	Fractal Geometry and their properties – Architectural applications	2
4.2	Works of Zvi Hecker – Shape Grammar - Shapes, rules and Label - Shape Grammar as analytical and synthetic tools	3
4.3	Combining Shape grammar and Genetic algorithm to optimize architectural solutions -	3
4.4	Hyper Surface – Introduction to Hyper surface and concepts of Liquid architecture.	2
5	**CASE STUDIES**	**10**
5.1	Case studies- Study, understanding and analysis of known examples at the national and international levels which demonstrates the contemporary theories of media and their influence on the perception of space and architecture, contemporary design processes and its relation to computation.	10

TOTAL NO OF HOURS **45**

Course Designers:

1. Dr.Jinu L Kitchley - hodarch@tce.edu
2. Ar.S.Thanga Lavanya - lavanya_arch@tce.edu

18GA120 **URBAN THEORIES AND METHODOLOGY**

Category	L	T	P	C
CFC	3	0	0	3

Preamble

The objective of the course is to provide explanations of Urban Design terminologies, definitions and methodologies for shaping and understanding of urban form; derived from both theory and empirical evidence. This course provides an understanding of development theories and the circumstances in which they evolved. It traces the path of urbanization as a process and examines the spatial correspondence between urban patterns through space and time and connected development paradigms.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Remember the urban theory in the sense of different ways of understanding cities the forces shaping cities, the physical patterns in the urban landscape and the consequences on life and planning.	**Remember**
CO2	Develop the skill to identify, different methodological approaches, technologies and foundation theories of urban design.	**Understand**
CO3	Gain knowledge by analyse to develop a common vocabulary and set of concepts with which to map, analyze, understand and explain the form, structure and development of the city.	**Understand**
CO4	Enhance academic interface with civil society and communities so as to contribute to practices and process of site.	**Analyse**
CO5	Analyse and reflect upon the interplay of economic, social, political and cultural forces shaping the city and its planning in different geographical contexts.	**Analyse**
CO6	Apply a set of theories in a specific urban area and analyse the implications in terms of preconditions for planning	**Apply**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	M	L	M
CO2	M	S	M	L
CO3	S	S	S	S
CO4	M	M	S	M
CO5	S	M	M	M
CO6	M	S	S	S

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Remember	10	10
Understand	10	10
Apply	40	40
Analyse	40	40

Course Level Assessment Questions

Course Outcome 1 (CO1):

1. What are the various tangible and intangible factors which as basis for urban design theories.
2. What is Perception of city form and pattern?

Course Outcome 2 (CO2)

1. Brief the factors which organizing and articulation of spaces of Residence.
2. Explain he practices manipulated for urban theories.

Course Outcome 3 (CO3)

1. Describe the image of the city with an example.
2. Explain the Colin Rowe and his critical analysis of the origins.

Course Outcome 4 (CO4)

1. Discus the in detail about the concept of over urbanization and sub urbanization.
2. What are the obstacles to Urban planning in India?

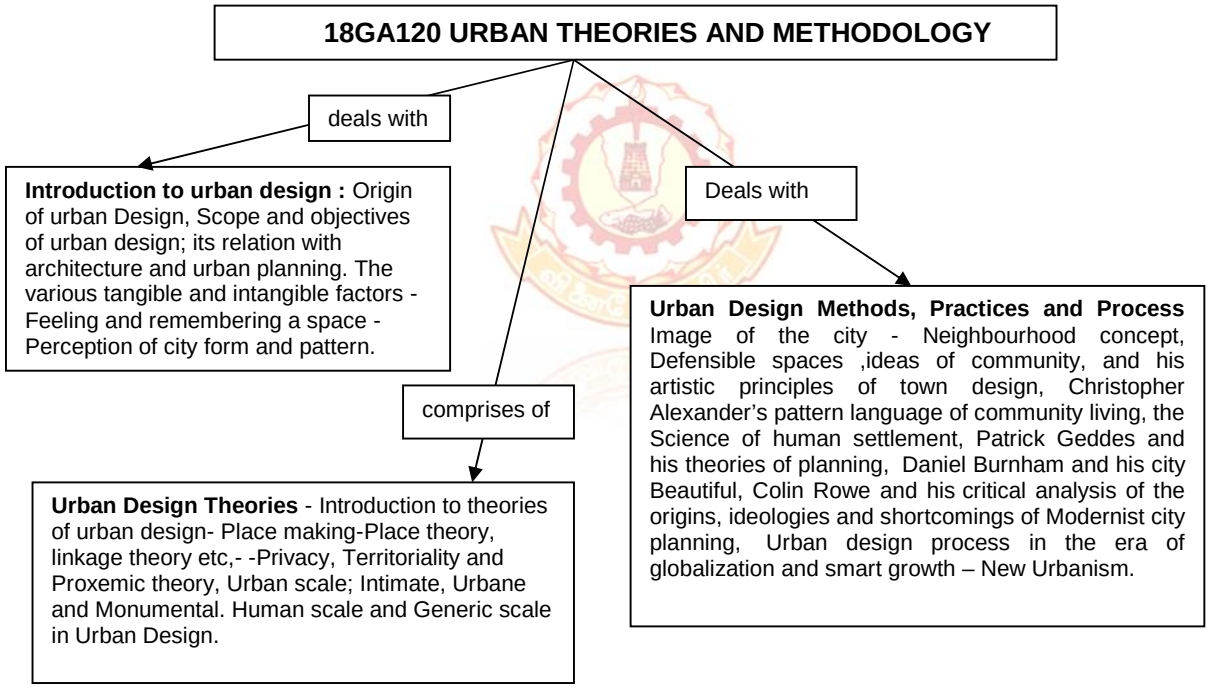
Course Outcome 5 (CO5)

1. Compare your city to two main competitors and recommend what requirements or capitals need improvements
2. Explain the changing attitudes of city dwellers regarding any cultural events.

Course Outcome 6 (CO6)

1. Describe the competitiveness of your city and compare this to two competing cities.
2. Explain the dimensions of the Urbanization process in the world countries with special emphasis on migration patterns.

Concept Map



Syllabus

Introduction to urban design-Origin of urban Design, Scope and objectives of urban design; its relation with architecture and urban planning. The various tangible and intangible factors which as basis for urban design theories and principles - Feeling and remembering a space - Perception of city form and pattern - Mental mapping - Jon Lang's Basic Human Needs – Meeting Safety Security Needs in Urban Spaces - Understanding, organizing and articulation of spaces of Residential, Commercial, Parks and Industrial spaces - Qualities of Asian Cities - **Urban Design Theories** - Introduction to theories of urban design- Place making-Place theory, linkage theory etc,- - Privacy, Territoriality and Proxemic theory, Urban scale; Intimate, Urbane and Monumental. Human scale and Generic scale in Urban Design - **Urban Design Methods, Practices and Process -** Kevin Lynch's Image of the city, Clearance Perry and his Neighbourhood concept, Oscar Newmans concepts of Defensible spaces , Jane Jacobs and her ideas of community, Gordon Cullen and his city perception, Camillo Sitte and his artistic principles of town design, Christopher Alexander's pattern language of community living, C.O. Doxiadis's Ekistics and the Science of human settlement, Patrick Geddes and his theories of planning, Daniel Burnham and his city Beautiful, Colin Rowe and his critical analysis of the origins, ideologies and shortcomings of

Modernist city planning, Rob Krier and his concepts of Urban space, Peter Calthorpe and his concepts of Ecology and Community, Ian L.McHarg and His Design with Nature, Rusong Wang and his principles of urban system regulation, Charles Correa and his essays on the issues of India, Archana Gupta and Anshuman Gupta's celebration of Indian Public Spaces, Susan Parnell and Sophie Oldfield's Critical urbanism and the Global South. Urban design process in the era of globalization and smart growth – New Urbanism.

References

1. Lawrence Halprin - CITIES - Reinhold Publishing Corporation N.Y. 1964.
2. Gosling and Maitland - URBAN DESIGN - St. Martin's Press, 1984.
3. Jonathan Barnett - An Introduction to Urban Design - Harper & Row, Publishers, N.Y., 1982

Course Contents and Lecture Schedule

S.No.	Topic	No. of lectures
1	**INTRODUCTION TO URBAN DESIGN**	**9**
1.1	Origin of urban Design, Scope and objectives of urban design; its relation with architecture and urban planning. The various tangible and intangible factors which as basis for urban design theories and principles - Feeling and remembering a space.	3
1.2	Perception of city form and pattern - Mental mapping - Jon Lang's Basic Human Needs – Meeting Safety Security Needs in Urban Spaces.	3
1.3	Understanding, organizing and articulation of spaces of Residential, Commercial, Parks and Industrial spaces - Qualities of Asian Cities.	3
2	**URBAN DESIGN THEORIES:**	**6**
2.1	Introduction to theories of urban design- Place making-Place theory, linkage theory etc,- - Privacy, Territoriality and Proxemic theory.	3
2.2	Urban scale; Intimate, Urbane and Monumental. Human scale and Generic scale in Urban Design.	3
3	**URBAN DESIGN METHODS, PRACTICES AND PROCESS**	**30**
3.1	Kevin Lynch's Image of the city, Clearance Perry and his Neighbourhood concept, Oscar New-mans concepts of Defensible spaces , Jane Jacobs and her ideas of community.	5
3.2	Gordon Cullen and his city perception, Camillo Sitte and his artistic principles of town design, Christopher Alexander's pattern language of community living.	5
3.3	C.O. Doxiadis Ekistics and the Science of human settlement, Patrick Geddes and his theories of planning, Daniel Burnham and his city Beautiful, Colin Rowe and his critical analysis of the origins, ideologies and shortcomings of Modernist city planning.	5
3.4	Rob Krier and his concepts of Urban space, Peter Calthorpe and his concepts of Ecology and Community, Ian.L.McHarg and His Design with Nature, Rusong Wang and his principles of urban system regulation.	5
3.5	Charles Correa and his essays on the issues of India, Archana Gupta and Anshuman Gupta's celebration of Indian Public Spaces.	5
3.6	Susan Parnell and Sophie Oldfield's Critical urbanism and the Global South. Urban design process in the era of globalization and smart growth – New Urbanism.	5
TOTAL NO OF HOURS		**45**

Course Designers:

1. Prof.G.Balaji - gbarch@tce.edu
2. Ar.M.Sindhuja - crissindhu@tce.edu

18GA130	CLIMATE CHANGE ADAPTATION AND RESILIENCE	Category	L	T	P	C
		CFC	3	0	0	3

Preamble

The course deals with the Climate change impacts at Global and Regional level. It also helps to analyse and evaluate the Vulnerability Assessment Methods. This course provides an opportunity to evaluate the range of possible adaptation strategies to increase its system's resilience and capacity to adapt to climate change. This course focuses on the Policies of Government on Climate change Adaptability.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Acquire knowledge about the effects and the impact of climate change on Global and Regional level.	**Understand**
CO2	Analyse the Vulnerability Assessment Methods and the National and International Action plans and to identify the parameters to be considered for a Climate Resilience and Adaptation	**Analyse**
CO3	Evaluate the range of possible adaptation strategies to increase its system's resilience and capacity to adapt to climate change.	**Evaluate**
CO4	Apply the strategies of mitigation and adaptation in their designs vulnerable to climate change.	**Apply**
CO5	Apply the strategies of resilience in climate change vulnerable areas as a societal responsibility.	**Apply**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	M	M	S
CO2	S	M	M	S
CO3	S	S	S	S
CO4	S	S	S	S
CO5	S	S	S	S

S-Strong; M-Medium; L-Low

Assessment Pattern

	Continuous Assessment Tests	Terminal Examination
Understand	**20**	**20**
Apply	**40**	**40**
Analyse	**20**	**20**
Evaluate	**20**	**20**

Course Level Assessment Questions

Course Outcome 1 (CO1)**:**

1. List out the impacts of Climate Change.
2. Write short notes on Green House effect.
3. What is a Functional Unit? Give an Example.

Course Outcome 2 (CO2)

1. Explain the Development and use of a Climatic model with a schematic representation.
2. Discuss the role of IPCC on Climate change.
3. Analyse the factors to be considered for the Vulnerability Assessment of a particular region.

Course Outcome 3 (CO3)

1. Compare the adaptation strategies for various impacts of Climate change on Buildings.
2. Evaluate the performance of Building Envelope as an adaptive measure to climate change.

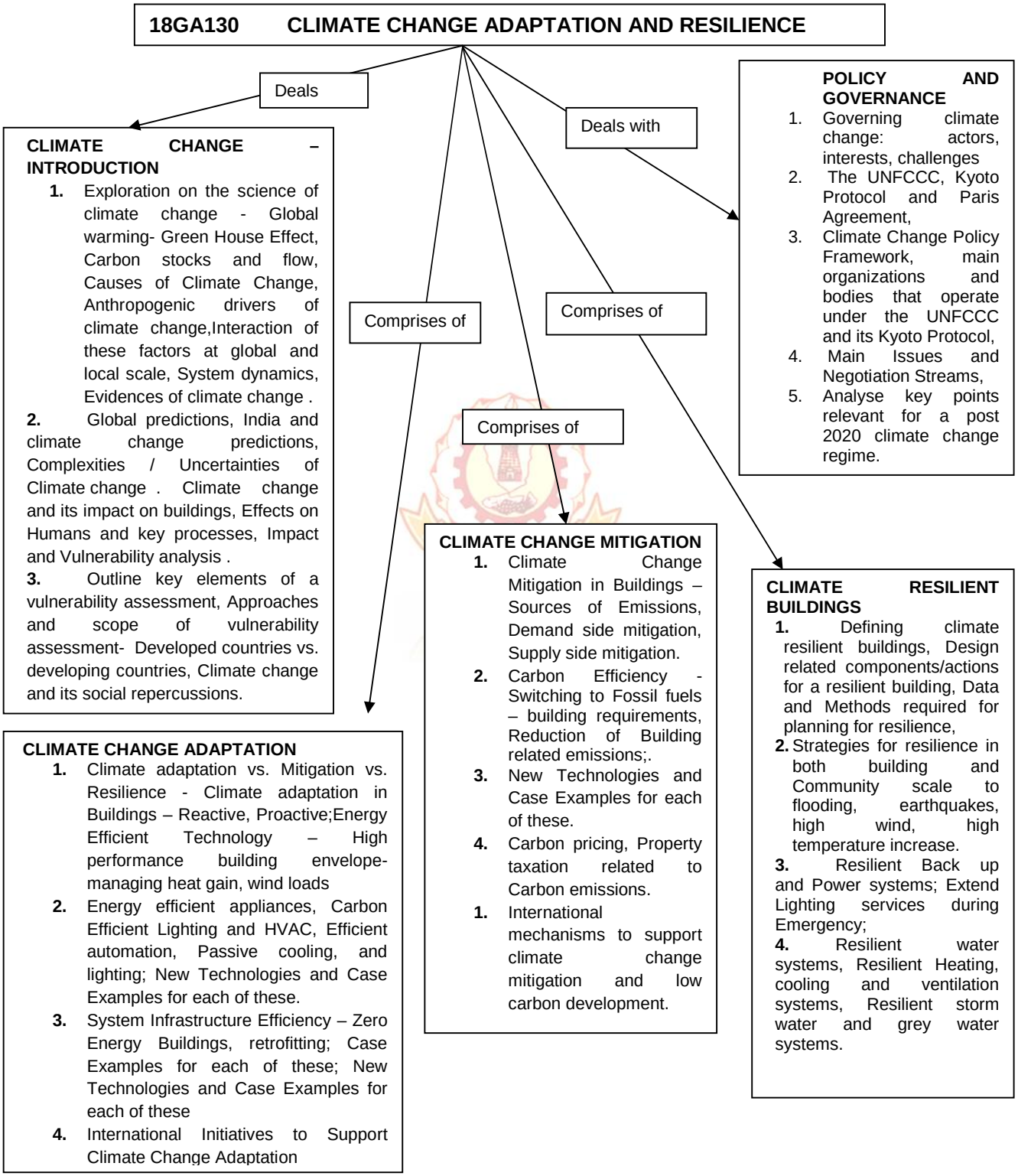
Course Outcome 4 (CO4)

1. Compare the adaptation strategies against the effect of Extreme temperature due to climate change.
2. Compare and Differentiate Mitigation, Adaptation and Resilience, with respective examples.

Course Outcome 5 (CO5)

1. Enumerate the strategies for resilience both in buildings and community scale for flooding .
2. Explain the techniques for resilient Back up and power systems in vulnerable areas.

Concept Map



Syllabus

CLIMATE CHANGE INTRODUCTION- Exploration on the science of climate change - Global warming- Green House Effect, Carbon stocks and flow, Causes of Climate Change, Anthropogenic

drivers of climate change, Interaction of these factors at global and local scale – System dynamics, Evidences of climate change- Global predictions, India and climate change predictions, Complexities / Uncertainties of Climate change . Climate change and its impact on buildings, Effects on Humans and key processes, Impact and Vulnerability analysis - Outline key elements of a vulnerability assessment, Approaches and scope of vulnerability assessment- Developed countries vs. developing countries, Climate change and its social repercussions. **CLIMATE CHANGE ADAPTATION -** Climate adaptation vs. Mitigation vs. Resilience - Climate adaptation in Buildings – Reactive, Proactive; Energy Efficient Technology – High performance building envelope- managing heat gain, wind loads- Energy efficient appliances, Carbon Efficient Lighting and HVAC, Efficient automation, Passive cooling, and lighting; New Technologies and Case Examples for each of these- System Infrastructure Efficiency – Zero Energy Buildings, retrofitting; Case Examples for each of these; New Technologies and Case Examples for each of these. **CLIMATE CHANGE MITIGATION-** Climate Change Mitigation in Buildings – Sources of Emissions, Demand side mitigation, Supply side mitigation- Carbon Efficiency - Switching to Fossil fuels – building requirements, Reduction of Building related emissions; New Technologies and Case Examples for each of these.Service Demand Reduction – Carbon pricing, Property taxation related to Carbon emissions. International mechanisms to support climate change mitigation and low carbon development. **CLIMATE RESILIENT BUILDINGS -** Defining climate resilient buildings, Design related components/actions for a resilient building, Data and Methods required for planning for resilience, Strategies for resilience in both building and Community scale to flooding, earthquakes. Resilient Back up and Power systems; Extend Lighting services during Emergency; Resilient water systems, Resilient Heating, cooling and ventilation systems, Resilient storm water and grey water systems. **POLICY AND GOVERNANCE-** Governing climate change: actors, interests, challenges, The UNFCCC, Kyoto Protocol and Paris Agreement, Climate Change Policy Framework, main organizations and bodies that operate under the UNFCCC and its Kyoto Protocol, Main Issues and Negotiation Streams, Analyse key points relevant for a post 2020 climate change regime.

References

1. Climate Change and Environment: Concepts and Strategies to Mitigate Impacts, by Devesh Sharma (Author), K C Sharma (Author).
2. The Adaptive Challenge of Climate Change Paperback – Edited by Professor Karen O'Brien ,Dr Elin Selboe
3. Environmental Sustainability and Climate Change Adaptation Strategies (Advances in Environmental Engineering and Green Technologies) by Wayne Ganpat (Editor), Wendy-Ann Isaac (Editor)
4. Climate Change at the City Scale: Impacts, Mitigation and Adaptation in Cape Town Hardcover – by Anton Cartwright (Editor), Susan Parnell (Editor), Gregg Oelofse (Editor), Sarah Ward (Editor)
5. Adaptation to climate change: from resilience to transformation, Mark Pelling.
6. Climate change and human development,Reid, Hannah
7. Displacement, development, and climate change : international organizations moving beyond their mandates,Hall, Nina
8. Evaluating Climate Change Action for Sustainable Development,Juha I. Uitto,Jyotsna Puri,Rob D. van den Berg
9. Management of water, energy and bio-resources in the era of climate change : emerging issues and challenges,Raju, N. Janardhana; Gossel, Wolfgang; Ramanathan, AL.; Sudhakar, M.Cham
10. Geoinformatics for Climate Change Studies Hardcover – by P. K. Joshi (Editor), T. P. Singh (Editor)

Course Contents and Lecture Schedule

S.No	Topic	No of Lectures
1	**Climate Change –Introduction**	**6**
1.1	Exploration on the science of climate change - Global warming- Green House Effect, Carbon stocks and flow, Causes of Climate Change, Anthropogenic drivers of climate change, Interaction of these factors at global and local scale – System dynamics, Evidences of climate change	2
1.2	Global predictions, India and climate change predictions, Complexities / Uncertainties of Climate change . Climate change and its impact on buildings, Effects on Humans and key processes, Impact and Vulnerability analysis.	2
1.3	Outline key elements of a vulnerability assessment, Approaches and scope of vulnerability assessment- Developed countries vs. developing countries, Climate change and its social repercussions.	2
2	**CLIMATE CHANGE ADAPTATION**	**10**
2.1	Climate adaptation vs. Mitigation vs. Resilience - Climate adaptation in Buildings – Reactive, Proactive;	2
2.2	Energy Efficient Technology – High performance building envelope- managing heat gain, wind loads	2
2.3	Energy efficient appliances, Carbon Efficient Lighting and HVAC, Efficient automation, Passive cooling, and lighting; New Technologies and Case Examples for each of these.	2
2.4	System Infrastructure Efficiency – Zero Energy Buildings, retrofitting; Case Examples for each of these; New Technologies and Case Examples for each of these.	2
2.5	International Initiatives to Support Climate Change Adaptation	2
3	**CLIMATE CHANGE MITIGATION**	**10**
3.1	Climate Change Mitigation in Buildings – Sources of Emissions, Demand side mitigation, Supply side mitigation.	2
3.2	Carbon Efficiency - Switching to Fossil fuels – building requirements, Reduction of Building related emissions;	2
3.3	New Technologies and Case Examples for each of these. Service Demand Reduction –	2
3.4	Carbon pricing, Property taxation related to Carbon emissions.	2
3.5	International mechanisms to support climate change mitigation and low carbon development.	2
4	**CLIMATE RESILIENT BUILDINGS**	**12**
4.1	Defining climate resilient buildings, Design related components/actions for a resilient building,	2
4.2	Data and Methods required for planning for resilience,	1
4.3	Strategies for resilience in both building and Community scale to flooding, earthquakes.	2
4.4	Resilient Back up and Power systems; Extend Lighting services during Emergency; Resilient water systems,	2
4.5	Resilient Heating, cooling and ventilation systems, Resilient storm water and grey water systems.	3
5	**POLICY AND GOVERNANCE**	**7**
5.1	Governing climate change: actors, interests, challenges, The UNFCCC, Kyoto Protocol and Paris Agreement,	3
5.2	Climate Change Policy Framework, main organizations and bodies that operate under the UNFCCC and its Kyoto Protocol,	2
5.3	Main Issues and Negotiation Streams, Analyse key points relevant for a post 2020 climate change regime.	2
TOTAL NO OF HOURS		**45**

Course Designers:

1. Dr.Jinu kitchley -hodarch@tce.edu
2. Ar.R.Meena Kumari -rmiarch@tce.edu

18GA140	STRUCTURES AND SERVICES FOR MEGA BUILDINGS	Category	L	T	P	C
		CFC	3	0	0	3

Preamble

This course deals with the concepts of mega buildings with relation to various types of structures such as Multi-Storey Buildings, High Rise Buildings and Sky Scrapers in Urban Areas. This course focuses on the Structural Systems in Substructure and Superstructure in Design of Mega Buildings and its integration in Mega Buildings. This course provides an opportunity to understand the Environmental Design and Green Concepts involved in Mega Buildings.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Acquire knowledge on the Structural Systems and integrate the Structural Systems in Architectural Design of Mega Buildings.	**Understand**
CO2	Analyse and assimilate the basics of the Building Services at Site Level and Building Level in Architectural Design of Mega Buildings	**Analyse**
CO3	Apply the concepts of Building Services at Site Level and Building Level in Architectural Design of Mega Buildings and concepts of environmental designs and landscape design as alternative design strategies in environmental systems.	**Apply**
CO4	Acquire knowledge on the concepts of Environmental Engineering practices such as Treatment of Water, Treatment of Sewage, Reuse of Water.	**Understand**
CO5	Apply the concepts of Landscape Design, Roof Gardens and Vertical Gardens in Urban Areas to control Environmental pollution, Urban Farming, Earth Sheltering	**Analyse**
CO6	Apply the concepts of Building Services at Site Level and Building Level in Architectural Design of Mega Buildings and concepts of environmental designs and landscape design as alternative design strategies in environmental systems.	**Apply**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	**S**	**L**	**M**	**M**
CO2	**S**	**L**	**S**	**M**
CO3	**S**	**M**	**L**	**M**
CO4	**S**	**M**	**L**	**M**
CO5	**S**	**M**	**L**	**M**
CO6	**S**	**M**	**L**	**M**

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Understand	**20**	**20**
Analyse	**40**	**40**
Apply	**40**	**40**

Course Level Assessment Questions

Course Outcome 1 (CO1):

1. Differentiate: Multi-Storey Building, High Rise Building and Mega Building

2. List the various building services involved in Mega Buildings.

Course Outcome 2 (CO2)

1. Explain the Building Services at Site Level in Establishment of Mega Buildings.
2. Explain the various Service Core Configurations in High Rise Buildings.

Course Outcome 3 (CO3)

1. Explain the Introduction to Mechanical, Electrical and Plumbing Services and services in multi-storey building
2. Discuss in detail about the Building Codes, Space Allocation of Fitments and Space Planning of Building Services.

Course Outcome 4 (CO4)

1. Explain the Services at Building Level such as Water Supply and Sanitation, Electrical Services, Fire Safety and Services.
2. Explain the Heating, Ventilation and Air Conditioning Systems, Communication and Networks in High Rise Buildings.

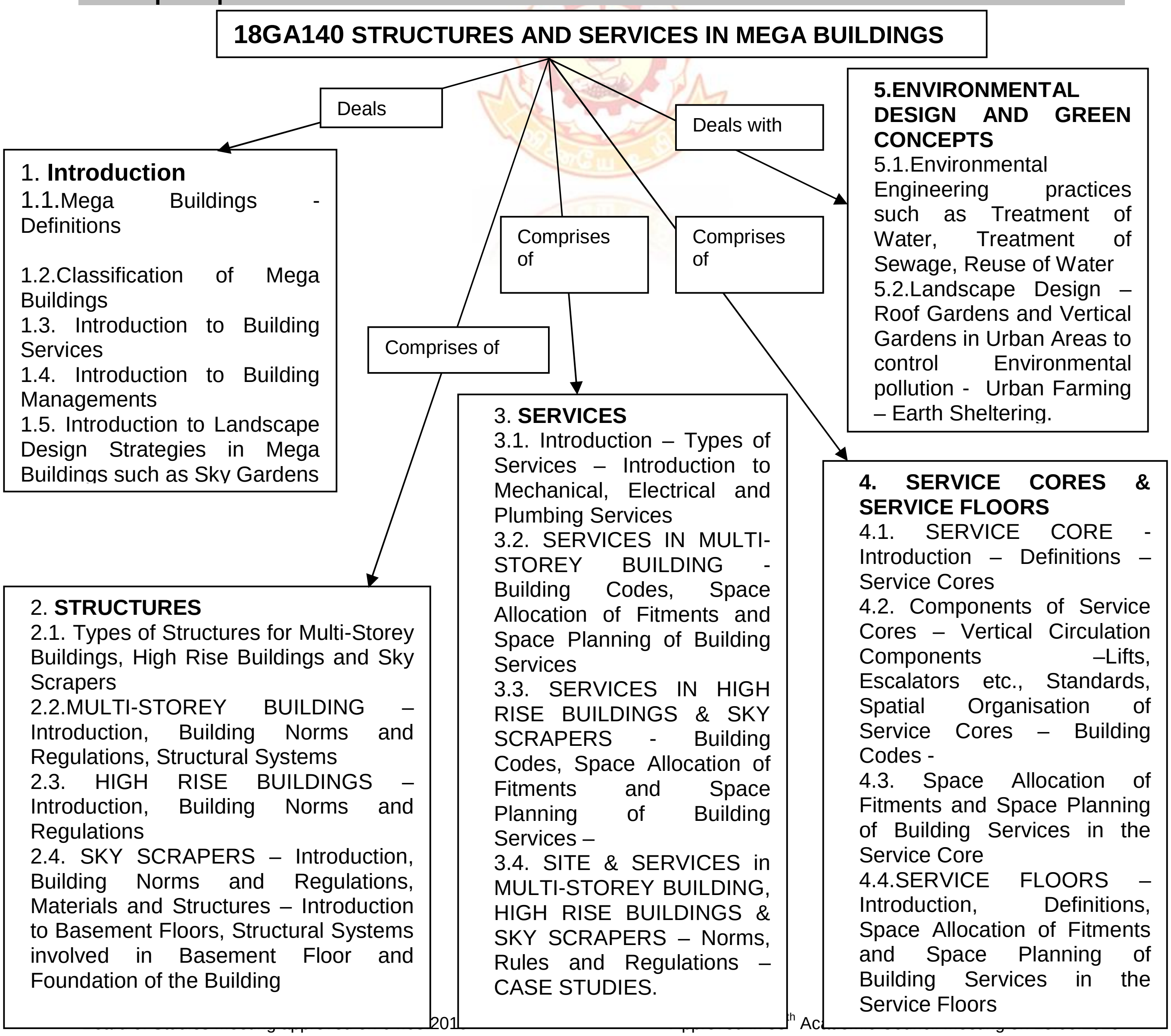
Course Outcome 5 (CO5)

1. Explain the Environmental Engineering practices such as Treatment of Water, Treatment of Sewage, Reuse of Water.
2. Discuss in detail about the Urban Farming and Earth Sheltering with suitable case studies.

Course Outcome 6 (CO6)

1. Explain the application of integration of building services with structures in Mega Buildings.
2. Discuss in detail about the application of landscape elements in Mega Buildings.

Concept Map



Syllabus

INTRODUCTION - Introduction to Mega Buildings – Definitions – Classification of Mega Buildings – Types – Multi-Storey Buildings, High Rise Buildings and Sky Scrapers – Introduction to Structure in Mega Buildings – Sub Structure and Super Structures – Introduction to Services at Building Level such as Water Supply and Sanitation, Electrical Services, Fire Safety and Services, Heating, Ventilation and Air Conditioning Systems, Communication and Networks – Introduction to Building Management Systems – Building Services at Site Level – Distribution Systems of all Building Services – Introduction to Landscape Design Strategies such as Sky Gardens (Roof Gardens, Vertical Gardens etc.) – Landscape Irrigation Systems. **STRUCTURES FOR MEGA BUILDINGS** - Introduction - Types of Structures for Multi-Storey Buildings, High Rise Buildings and Sky Scrapers – MULTI-STOREY BUILDING – Introduction, Building Norms and Regulations, Structural Systems – HIGH RISE BUILDINGS – Introduction, Building Norms and Regulations – SKY SCRAPERS – Introduction, Building Norms and Regulations, Materials and Structures – Introduction to Basement Floors, Structural Systems involved in Basement Floor and Foundation of the Building – CASE STUDIES. **SERVICES FOR MEGA BUILDINGS** - Introduction – Types of Services – Introduction to Mechanical, Electrical and Plumbing Services – SERVICES IN MULTI-STOREY BUILDING - Building Codes, Space Allocation of Fitments and Space Planning of Building Services – SERVICES IN HIGH RISE BUILDINGS & SKY SCRAPERS - Building Codes, Space Allocation of Fitments and Space Planning of Building Services – SITE & SERVICES in MULTI-STOREY BUILDING, HIGH RISE BUILDINGS & SKY SCRAPERS – Norms, Rules and Regulations – CASE STUDIES. **SERVICE CORES & SERVICE FLOORS** - SERVICE CORE - Introduction – Definitions – Service Cores – Components of Service Cores – Vertical Circulation Components –Lifts, Escalators etc., Standards, Spatial Organisation of Service Cores – Building Codes - Space Allocation of Fitments and Space Planning of Building Services in the Service Core – SERVICE FLOORS – Introduction, Definitions, Space Allocation of Fitments and Space Planning of Building Services in the Service Floors – CASE STUDIES. **ENVIRONMENTAL DESIGN AND GREEN CONCEPTS** - Introduction to Environmental Engineering practices such as Treatment of Water, Treatment of Sewage, Reuse of Water – Introduction to Landscape Design – Roof Gardens and Vertical Gardens in Urban Areas to control Environmental pollution - Urban Farming – Earth Sheltering – CASE STDIES.

References

1. Donald Watson, Michael J. Crosbie and John Hancock Callender, Time-Saver Standards for Architectural Design Data, Mcgraw – Hill International Editions, 1997.
2. A K Mittal, Electrical and Mechanical Services in High Rise Buildings Design and Estimation Manual, 2001
3. William J. Mcguinness, Benjamin Stein and John S. Reynolds, Mechanical and Electrical Equipment for Buildings, John Wiley & Sons, Inc. 1980.
4. Yahya Mohamad Yatim, Fire Safety Issues in High-Rise Residential Buildings: escape routes Design and specification, Lambert Academic Publishing, 2011

Course Contents and Lecture Schedule

S.No.	Topic	No. of lectures
1.	**INTRODUCTION**	**6**
1.1	Introduction to Mega Buildings – Definitions – Classification of Mega Buildings – Types – Multi-Storey Buildings, High Rise Buildings and Sky Scrapers – Introduction to Structure in Mega Buildings – Sub Structure and Super Structures	2

1.2	Introduction to Services at Building Level such as Water Supply and Sanitation, Electrical Services, Fire Safety and Services, Heating, Ventilation and Air Conditioning Systems, Communication and Networks	2
1.3	Introduction to Building Management Systems – Building Services at Site Level – Distribution Systems of all Building Services – Introduction to Landscape Design Strategies such as Sky Gardens (Roof Gardens, Vertical Gardens etc.) – Landscape Irrigation Systems.	2
2.	**STRUCTURES FOR MEGA BUILDINGS**	**10**
2.1	Introduction - Types of Structures for Multi-Storey Buildings, High Rise Buildings and Sky Scrapers	2
2.2	MULTI-STOREY BUILDING – Introduction, Building Norms and Regulations, Structural Systems	2
2.3	HIGH RISE BUILDINGS – Introduction, Building Norms and Regulations	2
2.4	SKY SCRAPERS – Introduction, Building Norms and Regulations, Materials and Structures	2
2.5	Introduction to Basement Floors, Structural Systems involved in Basement Floor and Foundation of the Building – CASE STUDIES.	2
3	**SERVICES FOR MEGA BUILDINGS**	**12**
3.1	Introduction – Types of Services – Introduction to Mechanical, Electrical and Plumbing Services	3
3.2	SERVICES IN MULTI-STOREY BUILDING - Building Codes, Space Allocation of Fitments and Space Planning of Building Services	3
3.3	SERVICES IN HIGH RISE BUILDINGS & SKY SCRAPERS - Building Codes, Space Allocation of Fitments and Space Planning of Building Services	3
3.4	SITE & SERVICES in MULTI-STOREY BUILDING, HIGH RISE BUILDINGS & SKY SCRAPERS – Norms, Rules and Regulations – CASE STUDIES.	3
4	**SERVICE CORES & SERVICE FLOORS**	**9**
4.1	SERVICE CORE - Introduction – Definitions – Service Cores – Components of Service Cores – Vertical Circulation Components –Lifts, Escalators etc., Standards, Spatial Organisation of Service Cores – Building Codes - Space Allocation of Fitments and Space Planning of Building Services in the Service Core	5
4.2	SERVICE FLOORS – Introduction, Definitions, Space Allocation of Fitments and Space Planning of Building Services in the Service Floors – CASE STUDIES.	4
5	**ENVIRONMENTAL DESIGN AND GREEN CONCEPTS**	**8**
5.1	Introduction to Environmental Engineering practices such as Treatment of Water, Treatment of Sewage, Reuse of Water	4
5.2	Introduction to Landscape Design – Roof Gardens and Vertical Gardens in Urban Areas to control Environmental pollution - Urban Farming – Earth Sheltering – CASE STUDIES.	4

TOTAL NO OF HOURS **45**

Course Designers:

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18GA210 **RESEARCH METHODOLOGY**

Category	L	T	P	C
CFC	3	0	0	3

Preamble

To introduce the importance of critical inquiry as a way of gaining knowledge and expose to the various forms of research and research methodologies/processes.To engage this understanding in the specific field of architectural research.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Develop the skill to identify, decipher and interpret issues relating to architecture based on research enquiry methods.	**Understand**
CO2	Analyse different methods of conducting research and research writing.	**Analyze**
CO3	Redefine a social Problem into a Research Problem, generate a methodology to prove it and convert it into technical /Popular Reports.	**Apply, Analyse, and Create**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	M	M	L	L
CO2	M	M	L	L
CO3	S	S	S	S

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Understand	20	20
Apply	40	40
Analyse	20	20
Create	20	20

Course Level Assessment Questions

Course Outcome 1 (CO1)

1. Enumerate the types of Research and Illustrate with examples.
2. Discuss the Research Process in detail.

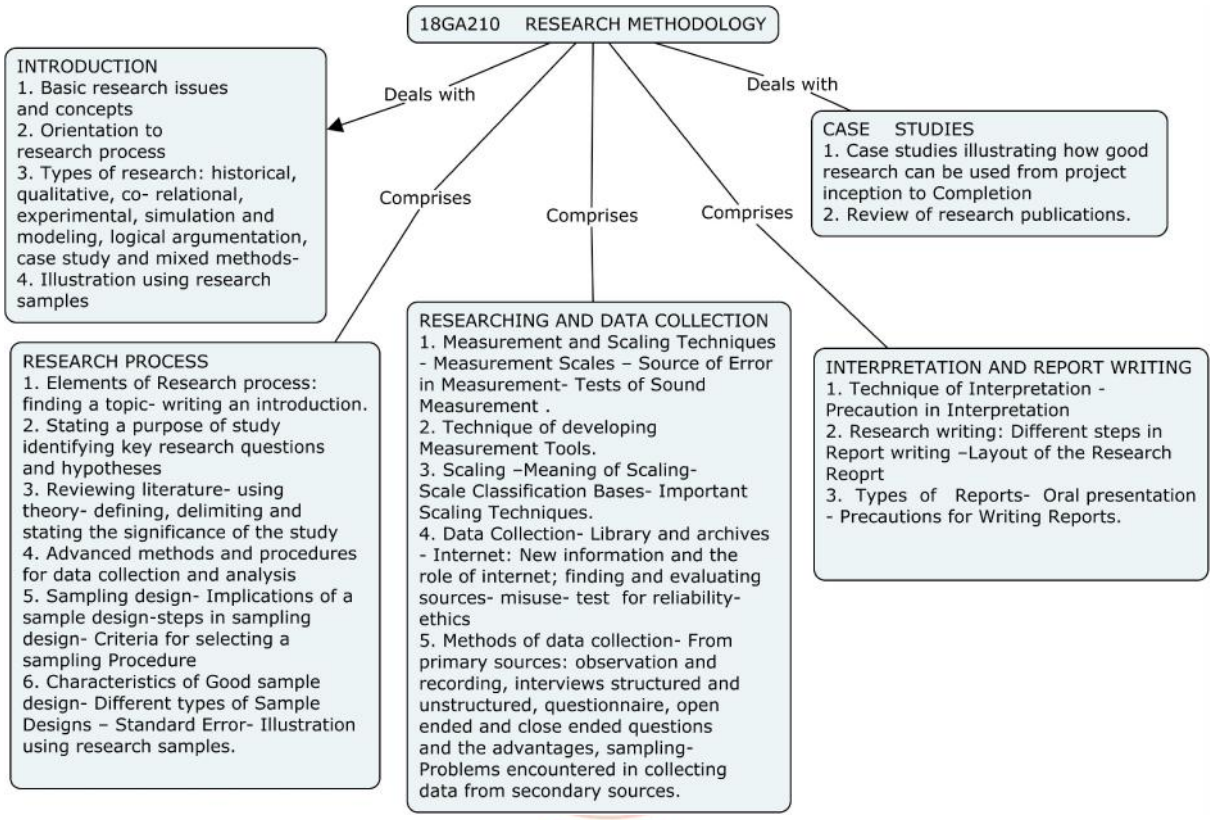
Course Outcome 2 (CO2)

1. Analyse different methods of conducting Research and suggest a suitable method for a particular Research.
2. Discuss in detail the criteria for selecting a sampling procedure.

Course Outcome 3 (CO3)

1. Redefine a social issue into a Research Problem and create a Methodology to solve it.
2. Write a detailed Technical and Popular report for a Research.

Concept Map



Syllabus

INTRODUCTION- Basic research issues and concepts- orientation to research process- types of research: historical, qualitative, co-relational, experimental, simulation and modeling, logical argumentation, case study and mixed methods- illustration using research samples -**RESEARCH PROCESS -**Elements of Research process: finding a topic- writing an introduction- stating a purpose of study identifying key research questions and hypotheses- reviewing literature- using theory- defining, delimiting and stating the significance of the study, advanced methods and procedures for data collection and analysis-sampling design- Implications of a sample design-steps in sampling design-Criteria for selecting a sampling Procedure – Characteristics of Good sample design-Different types of Sample Designs – Standard Error- Illustration using research samples. **RESEARCHING AND DATA COLLECTION -**Measurement and Scaling Techniques-Measurement Scales – Source of Error in Measurement- Tests of Sound Measurement – Technique of developing Measurement Tools –Scaling –Meaning of Scaling- Scale Classification Bases- Important Scaling Techniques –Data Collection- Library and archives- Internet: New information and the role of internet; finding and evaluating sources- misuse- test for reliability-ethics Methods of data collection- From primary sources: observation and recording, interviews structured and unstructured, questionnaire, open ended and close ended questions and the advantages, sampling- Problems encountered in collecting data from secondary sources.
INTERPRETATION AND REPORT WRITING Technique of Interpretation –Precaution in Interpretation - Research writing: Different steps in Report writing –Layout of the Research Reoprt – Types of Reports- Oral presentation- Precautions for Writing Reports. **CASE STUDIES** Case studies illustrating how good research can be used from project inception to Completion- review of research publications.

References

1. Linda Groat and David Wang; Architectural Research Methods – 2nd edition ‘,John Wiley & Sons Inc,Hoboken,New Jersey, US , 2013.

2. Wayne C Booth; Joseph M Williams; Gregory G. Colomb; 'The Craft of Research' , 3rd Edition; Chicago guides to writing, editing and publishing;2008
3. Iain Borden and Kaaterina Ruedi Ray ; The Dissertation: An Architecture Student's Handbook; Architectural Press; 2006
4. Ranjith Kumar; Research Methodology- A step by step guide for beginners-3rd Edition ; Sage Publications;2011
5. John W Creswell; Research design: Qualitative, Quantitative and Mixed Methods Approaches; Sage Publications; 2011.
6. JA Smith, P Flowers, M Larkin -Interpretative Phenomenological Analysis: Theory, Method and Research (English) FIR Edition- Sage Publication -2009.

Course Contents and Lecture Schedule

S.No.	Topic	No. of lectures
1	**INTRODUCTION**	**9**
1.1	Basic research issues and concepts	1
1.2	Orientation to research process	2
1.3	Types of research: historical, qualitative, co-relational, experimental, simulation and modeling, logical argumentation, case study and mixed methods	4
1.4	Illustration using research samples	2
2	**RESEARCH PROCESS**	**12**
2.1	Elements of Research process: finding a topic- writing an introduction	2
2.2	stating a purpose of study identifying key research questions and hypotheses	2
2.3	Reviewing literature- using theory- defining, delimiting and stating the significance of the study	2
2.4	Advanced methods and procedures for data collection and analysis	2
2.5	Sampling design- Implications of a sample design-steps in sampling design- Criteria for selecting a sampling Procedure	2
2.6	Characteristics of Good sample design-Different types of Sample Designs – Standard Error- Illustration using research samples.	2
3	**RESEARCHING AND DATA COLLECTION**	**12**
3.1	Measurement and Scaling Techniques- Measurement Scales – Source of Error in Measurement	3
3.2	Tests of Sound Measurement – Technique of developing Measurement Tools	2
3.3	Scaling –Meaning of Scaling- Scale Classification Bases- Important Scaling Techniques	2
3.4	Data Collection- Library and archives- Internet: New information and the role of internet; finding and evaluating sources- misuse- test for reliability- ethics	2
3.5	Methods of data collection- From primary sources: observation and recording, interviews structured and unstructured, questionnaire, open ended and close ended questions and the advantages, sampling- Problems encountered in collecting data from secondary sources.	3
4	**INTERPRETATION AND REPORT WRITING**	**6**
4.1	Technique of Interpretation ,Precaution in Interpretation	1
4.2	Research writing: Different steps in Report writing –Layout of the Research Reoprt	3
4.3	Types of Reports- Oral presentation- Precautions for Writing Reports.	2
5	**CASE STUDIES**	**6**
5.1	Case studies illustrating how good research can be used from project inception to Completion	3
5.2	Review of research Publications	3
	TOTAL NO OF HOURS	**45**

Course Designers:

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18GA220 **URBAN RENEWAL AND CONSERVATION**

Category	L	T	P	C
CFC	3	0	0	3

Preamble

Architecture being a multifaceted profession, it requires exposure to understand Architectural Conservation. The understanding of the principles of Urban Renewal that can be used as a design tool across various zones.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able t

CO1	Develop the skill to identify, decipher and interpret issues relating to architecture based on urban conservation through Multidisciplinary approach.	**Analyse, Apply and Create**
CO2	Gain knowledge of different methods for assessing architectural values and significance.	**Analyse, Apply and Create**
CO3	Integrate the techniques in urban conservation with the guidance of various methods/discipline discussed.	**Apply and Create**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	M	L	L
CO2	M	L	S	-
CO3	S	S	S	S

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Understand	**20**	**20**
Analyse	**20**	**20**
Apply	**30**	**30**
Create	**30**	**30**

Course Level Assessment Questions

Course Outcome 1 (CO1)

1. Define Social Change.
2. What are the economic impacts of Urbanization in urban India?

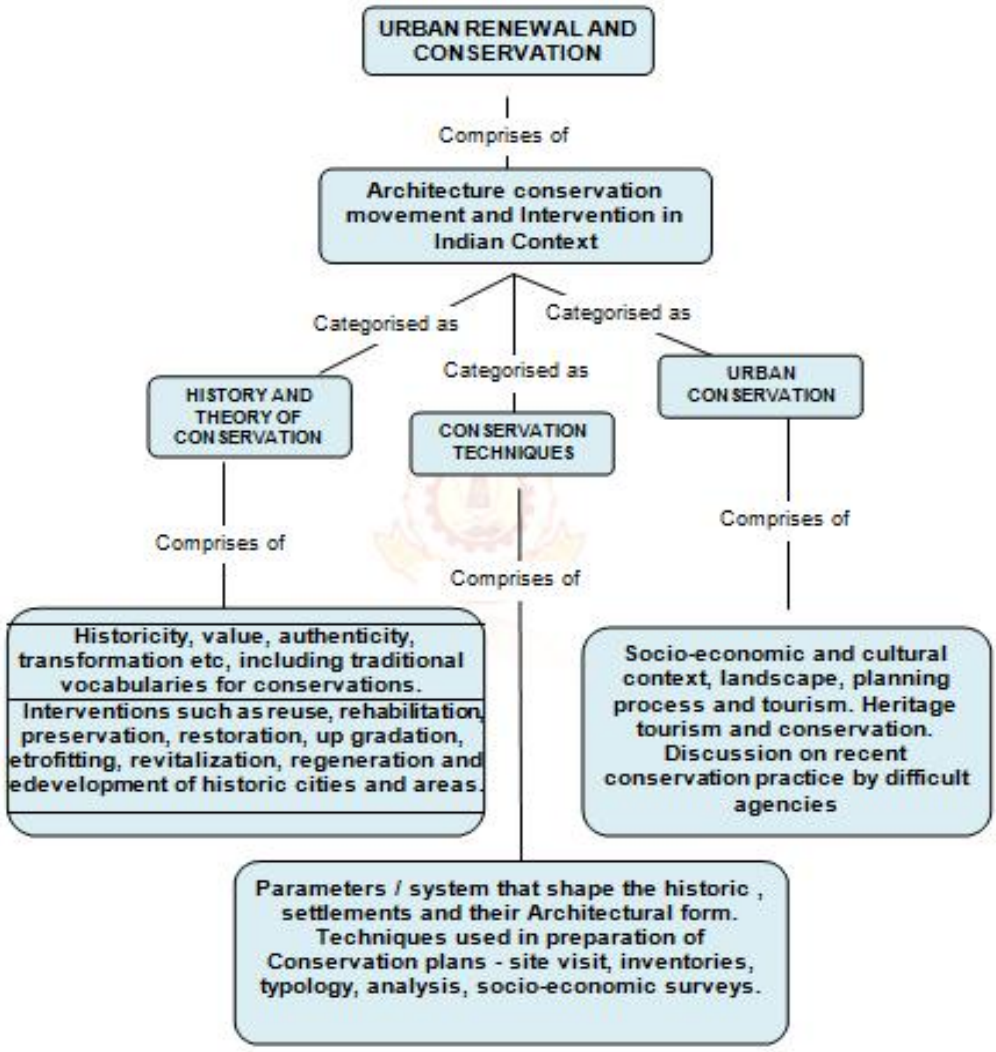
Course Outcome 2 (CO2)

1. Explain the Process of Land Utilization patterns made in India?
2. What is meant by resource conservation? Explain in detail about the schemes for resource conservation.

Course Outcome 3 (CO3)

1. What is meant by resource conservation? Explain in detail about the schemes for resource conservation.
2. What is urban renewal? State the importance of urban renewal programme. Explain any one method of urban renewal in detail.

Concept Map



Syllabus

History of Architecture Conservation Movement in India- Scope of Architectural Conservation in Indian context - definitions and terminologies : historicity, value, authenticity, transformation etc, including traditional vocabularies for conservations - interventions such as reuse, rehabilitation, preservation, restoration, up gradation, retrofitting, revitalization, regeneration and redevelopment of historic cities and areas. - Morphology of a historic settlement and its associated region - parameters / system that shape the historic settlements and their Architectural form ; the city shaped in Indian context. Historic enclaves, their values, present condition and context. Techniques used in preparation of Conservation plans - site visit, inventories, typology, analysis, socio-economic surveys. - Definition of Urban Renewal - need of Urban Renewal in Indian context - integrated approach to conservatory Urban renewal - Socio-economic and cultural context, landscape, planning process and tourism. Heritage tourism and conservation. Discussion on recent conservation practice by difficult agencies. Institution frame work for urban conservation and renewal strategies - inner city regeneration, adaptive reuse, infill development etc in programmes like JNNURM, SMART CITY MISSION etc. Approaches in the world - New York, Chester, Cairo.

References

1. M. Feilden, Bernard; Conservation of Historic Buildings; Published by Architectural Press; 3rd Edition, 2003.
2. Ashworth, G.J. & Tunbridge, J.E.; the Tourist – Historic City; Pub. Published by Belhaven Press, London and New York.
3. Latham, Derek; Creative Re-use of Buildings; Published by Donhead, Edition, 2007.

4. W. Install, Donald & Associates; Chester – A Study in Conservation; Published by London Her Majesty's Stationery Office, Edition 1968.
5. K. Parajuli, Yogeshwar; Bhaktapur Development Project – Experience in Preservation and Restoration in a Medieval Town; Edition 1974-85
6. Cohen, Nahoum; Urban Planning Conservation and Preservation, Published by McGraw Hill, Edition 2001.
7. Menon, A.G.K. & Thapar, B.K.; Historic Towns and Heritage Zones; Published by INTACH, Edition 2002.
8. Petruccioli , Attilio; After Amnesia – Learning from the Islamic Mediterranean Urban Fabric; Published by ICAR, Edition 2009.
9. J. Larkham, Peter; Conservation and the City; Published by Rout Ledge. London and New York, 1st edition 1996.
10. Greffe, Xavier; Managing our Cultural Heritage; Published by Aryan Books International, N.D. 1st edition 2001.
11. The Future of Asia's Past – Preservation of the Architectural Heritage of Asia; Published by The Getty Conservation Institute, Edition 1995.
12. Pederson, Arthur; Managing Tourism at World Heritage Sites; Published by UNESCO World Heritage Centre, Edition 2002.
13. International Charters for Conservation and Restoration, Published by ICOMOS.
14. Burrows, G.S.; Chichester – A Study in Conservation; Published by London Her Majesty's Stationery Office; Edition 1968

Course Contents and Lecture Schedule

S.No.	Topic	No. of lectures
1.	**HISTORY AND THEORY OF CONSERVATION**	**15**
1.1	History of Architecture Conservation Movement in India.	3
1.2	Scope of Architectural Conservation in Indian context	3
1.3	Definitions and terminologies : historicity, value, authenticity, transformation etc, including traditional vocabularies for conservations.	3
1.4	Interventions such as reuse, rehabilitation, preservation, restoration, up gradation, retrofitting, revitalization, regeneration and redevelopment of historic cities and areas.	6
2.	**CONSERVATION TECHNIQUES**	**15**
2.1	Morphology of a historic settlement and its associated region.	3
2.2	Parameters / system that shape the historic Architectural form.	3
2.3	The city shaped in Indian context. Historic enclaves, their values, present condition and context.	3
2.4	Techniques used in preparation of Conservation plans - site visit, inventories, typology, analysis, socio-economic surveys.	6
3.	**URBAN CONSERVATION**	**15**
3.1	Definition of Urban Renewal - need of Urban Renewal in Indian context.	1
3.2	Integrated approach to conservatory Urban renewal.	1
3.3	Socio-economic and cultural context, landscape, planning process and tourism.	3
3.4	Heritage tourism and conservation. Discussion on recent conservation practice by difficult agencies.	3
3.5	Institution frame work for urban conservation and renewal strategies.	2
3.6	Inner city regeneration, adaptive reuse, infill development etc in programmes like JNNURM, SMART CITY MISSION etc.	3
3.7	Approaches in the world - New York, Chester, Cairo.	2
	TOTAL NO OF HOURS	**45**

Course Designers:

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2. Prof M.SINDHUJA crissindhu@tce.edu

18GA310	CONTEMPORARY ARCHITECTURAL TRENDS	Category	L	T	P	C
		CFC	3	0	0	3

Preamble

Architecture in the contemporary world does not have an unified style so the study of contemporary trends in the modern context enables the student to understand the emergence of new building typologies and the response of architecture to technical and technological advancements in the current era. The understanding is enhanced by detail study of works of contemporary architects and emerging practices, philosophies and theories.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Generate skills to understand the various trends in design philosophies.	**Understand**
CO2	Analyze the emerging trends and influencing parameters in contemporary architecture.	**Analyze**
CO3	Identify and apply various tools of technology in developing the trends in architectural practices.	**Apply**
CO4	Develop knowledge in understanding theories and practices in contemporary architecture.	**Understand**
CO5	Analyze the evolving contemporary style with it's related theories in architectural practices.	**Analyze**
CO6	Application values of various theories in contemporary architecture.	**Apply**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	L	M	M	S
CO2	S	M	M	M
CO3	L	L	S	S
CO4	L	M	M	S
CO5	S	M	M	M
CO6	L	L	S	S

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Understand	30	30
Apply	30	30
Analyse	40	40

Course Level Assessment Questions

Course Outcome 1 (CO1)

1. Discuss the various technological trends in architecture recently with examples.
2. Explain the design philosophies of late 20th century architecture influencing 21st century trends.

Course Outcome 2 (CO2)

1. Analyse the emerging concepts that influence practice of sustainable architecture.
2. Discuss the contemporary design philosophies of 21st century architects.

Course Outcome 3 (CO3)

1. Discuss the application of new tools of technology influencing new trends in built forms
2. Explain the emerging cultural theorists influencing the utopian societies.

Course Outcome 4 (CO4)

1. Explain the significance of theory proposed by Siegfried Kracauer for construction of space..
2. Explain the production of space in urban space by Henri Lefebvre.

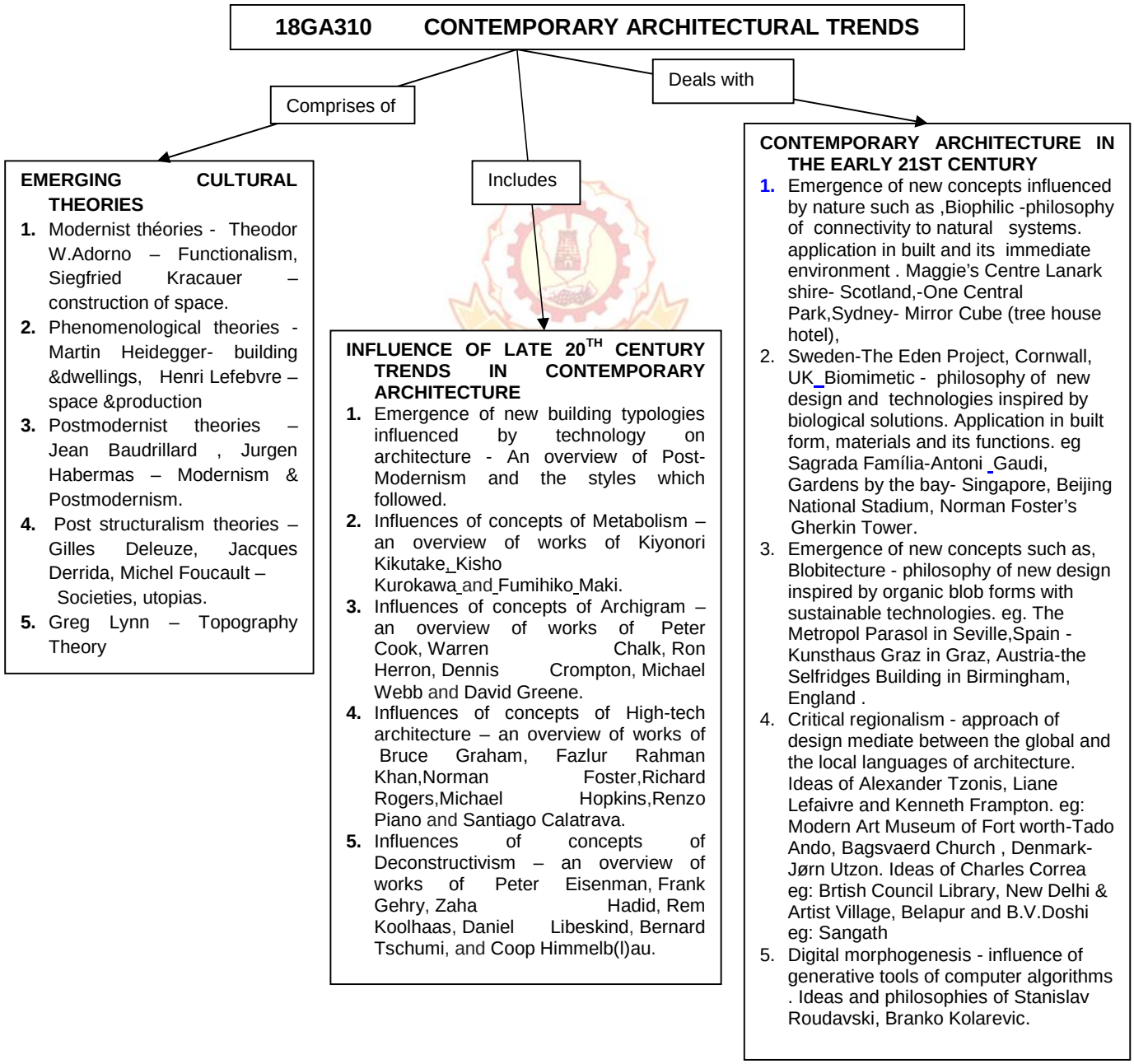
Course Outcome 5 (CO5)

1. Analyze the influence of Archigram in the evolution of blobitecture.
2. Analyze the concept of deconstruction influencing contemporary architecture.

Course Outcome 6 (CO6)

1. Explain the sustainable values inspired by the application of Biometric philosophies in architecture.
2. Discuss 'Critical Regionalism' as an approach which merges the global and local language of architecture.

Concept Map



Syllabus

EMERGING CULTURAL THEORIES - Modernist théories - Theodor W.Adorno – Functionalism, Siegfried Kracauer – construction of space. - Phenomenological theories - Martin Heidegger-building &dwellings, Henri Lefebvre – space &production - Postmodernist theories – Jean Baudrillard , Jurgen Habermas – Modernism & Postmodernism - Post structuralism theories – Gilles Deleuze, Michel Foucault – Societies, utopias. – Greg Lynn – Topography Theory. **INFLUENCE OF LATE 20TH CENTURY TRENDS IN CONTEMPORARY ARCHITECTURE** - Emergence of new building typologies influenced by technology on architecture - An overview of Post-Modernism and the styles which followed. Influences of concepts of Metabolism – an overview of works of Kiyonori Kikutake, Kisho Kurokawa and Fumihiko Maki. - Influences of concepts of Archigram – an overview of works of Peter Cook, Warren Chalk, Ron Herron, Dennis Crompton, Michael Webb and David Greene.- Influences of concepts of High-tech architecture – an overview of works of Bruce Graham, Fazlur Rahman Khan,Norman Foster,Richard Rogers,Michael Hopkins,Renzo Piano and Santiago Calatrava. - Influences of concepts of Deconstructivism – an overview of works of Peter Eisenman, Frank Gehry, Zaha Hadid, Rem Koolhaas, Daniel Libeskind, Bernard Tschumi, and Coop Himmelb(l)au. - **CONTEMPORARY ARCHITECTURE IN THE EARLY 21ST CENTURY** - Emergence of new concepts influenced by nature such as , Biophilic -philosophy of connectivity to natural systems. application in built and its immediate environment . Maggie's Centre Lanark shire-Scotland,-One Central Park,Sydney- Mirror Cube (tree house hotel), Sweden-The Eden Project, Cornwall, UK - Biomimetic - philosophy of new design and technologies inspired by biological solutions. Application in built form, materials and its functions. eg Sagrada Família-Antoni Gaudi, Gardens by the bay- Singapore, Beijing National Stadium, Norman Foster's Gherkin Tower. - Emergence of new concepts such as, - Blobitecture - philosophy of new design inspired by organic blob forms with sustainable technologies. eg. The Metropol Parasol in Seville,Spain - Kunsthaus Graz in Graz, Austria-the Selfridges Building in Birmingham, England - Critical regionalism - approach of design mediate between the global and the local languages of architecture. Ideas of Alexander Tzonis, Liane Lefaivre and Kenneth Frampton. eg: Modern Art Museum of Fort worth-Tado Ando, Bagsvaerd Church , Denmark- Jørn Utzon. - Digital morphogenesis - influence of generative tools of computer algorithms . Ideas and philosophies of Stanislav Roudavski, Branko Kolarevic.

References

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3. Mark R.Cruvellier, Bjorn N. Sandaker and Luben Dimcheff; Model Perspectives – Structure, Architecture and Culture; Routledge – Taylor & Francis Group, London and New York; 2017
4. SOM – Adrian Smith, FAIA of Skidmore, Owings & Merrill LLP; Archiworld Co, Ltd, Korea; 2002
5. Lynn, Greg. Folds, Bodies & Blobs : Collected Essays. La Lettre volée, 1998. ISBN
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Course Contents and Lecture Schedule

S.No.	Topic	No. of lectures
1	**EMERGING CULTURAL THEORIES**	**20**
1.1	Modernist théories - Theodor W.Adorno – Functionalism, Siegfried Kracauer – construction of space.	4
1.2	Phenomenological theories - Martin Heidegger- building &dwellings, Henri Lefebvre – space &production	4
1.3	Postmodernist theories – Jean Baudrillard , Jurgen Habermas – Modernism & Postmodernism	4
1.4	Post structuralism theories – Gilles Deleuze, Jacques Derrida, Michel Foucault – Societies, utopias.	4
1.5	Greg Lynn – Topography Theory	4
2	**INFLUENCE OF LATE 20TH CENTURY TRENDS IN CONTEMPORARY ARCHITECTURE**	**9**
2.1	Emergence of new building typologies influenced by technology on architecture An overview of Post-Modernism and the styles which followed.	2
2.2	Influences of concepts of Metabolism – an overview of works of Kiyonori Kikutake, Kisho Kurokawa and Fumihiko Maki.	1
2.3	Influences of concepts of Archigram – an overview of works of Peter Cook, Warren Chalk, Ron Herron, Dennis Crompton, Michael Webb and David Greene.	2
2.4	Influences of concepts of High-tech architecture – an overview of works of Bruce Graham, Fazlur Rahman Khan,Norman Foster,Richard Rogers,Michael Hopkins,Renzo Piano and Santiago Calatrava.	2
2.5	Influences of concepts of Deconstructivism – an overview of works of Peter Eisenman, Frank Gehry, Zaha Hadid, Rem Koolhaas, Daniel Libeskind, Bernard Tschumi, and Coop Himmelb(l)au.	2
3	**CONTEMPORARY ARCHITECTURE IN THE EARLY 21ST CENTURY**	**16**
3.1	Emergence of new concepts influenced by nature such as , Biophilic -philosophy of connectivity to natural systems. application in built and its immediate environment . Maggie's Centre Lanark shire-Scotland,-One Central Park,Sydney- Mirror Cube (tree house hotel), Sweden-The Eden Project, Cornwall, UK Biomimetic - philosophy of new design and technologies inspired by biological solutions. Application in built form, materials and its functions. eg Sagrada Família-Antoni Gaudi, Gardens by the bay- Singapore, Beijing National Stadium, Norman Foster's Gherkin Tower.	8
3.2	Emergence of new concepts such as, Blobitecture - philosophy of new design inspired by organic blob forms with sustainable technologies. eg. The Metropol Parasol in Seville,Spain - Kunsthaus Graz in Graz, Austria-the Selfridges Building in Birmingham, England Critical regionalism - approach of design mediate between the global and the local languages of architecture. Ideas of Alexander Tzonis, Liane Lefaivre and Kenneth Frampton. eg: Modern Art Museum of Fort worth-Tado Ando, Bagsvaerd Church , Denmark- Jørn Utzon.Ideas of Charles Correa eg: Brtish Council Library, New Delhi & Artist Village, Belapur and B.V.Doshi eg: Sangath Digital morphogenesis - influence of generative tools of computer algorithms . Ideas and philosophies of Stanislav Roudavski, Branko Kolarevic.	8
TOTAL NO OF HOURS		**45**

Course Designers:

1.Ar.P.Vivek pvkarch@tce.edu
2.Ar.A.Siva Barathi asbarch@tce.edu

18GA320 **URBAN ECOLOGY**

Category	L	T	P	C
CFC	3	0	0	3

Preamble

This course deals with the basic concepts of urban ecology and knows its importance. This course provides an opportunity to understand the phenomenon of Climate Change in urban areas, This course the focuses on the understanding of urban heat island effects and the mitigation measures. The understanding of hydrology, geology, biodiversity, flora and fauna in urban areas is enhanced in the urban context.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able t

CO1	To understand basics of ecology, ecosystem and components of ecosystem in urban areas.	**Understand**
CO2	To analyse and assimilate the basics of urban ecology in terms of Urban Climate, Micro Climate Modification in Urban Areas, Mitigation Measures, integration of the hydrological aspects and geological aspects in urban areas, biodiversity in urban context.	**Analyse**
CO3	To apply the concepts of Urban Ecology, Urban Climate, Urban Hydrology, Urban Geology in Design and Development in Urban Areas with a sustainable approach.	**Apply**
CO4	To apply the concepts of basics of urban ecology in terms of Urban Climate, Micro Climate Modification in Urban Areas, Mitigation Measures, integration of the hydrological aspects and geological aspects in urban areas, biodiversity in urban context.	**Apply**
CO5	To apply the concepts of Urban Geology, Urban soil, Soil characteristics, Fertility and bearing capacity, Soil structure Factor affecting soil quality, Pollution, Reclamation and Restoration - Soil management.	**Apply**
CO6	To apply the concepts of Urban Ecology, Urban Climate, Urban Hydrology, in Design and Development in Urban Areas with a sustainable approach.	**Apply**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	M	L	M	M
CO2	S	L	S	M
CO3	M	M	L	M
CO4	S	L	S	M
CO5	S	M	L	M
CO6	S	M	L	M

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Understand	40	40
Analyse	40	40
Apply	20	20

Course Level Assessment Questions

Course Outcome 1 (CO1)

1. Define: Urban Ecology.
2. List the various components in Urban Ecosystems.

Course Outcome 2 (CO2)

1. Explain in detail about the Principles, components and characteristics of Systems, Classification of ecological systems
2. Discuss in detail about Structural and functional interactions of environmental systems, Environmental systems as energy systems, Mechanisms of steady-state maintenance in open and closed systems.

Course Outcome 3 (CO3)

1. Explain the factors influencing climate in urban areas.
2. Explain in detail about Urban Water Cycle.

Course Outcome 4 (CO4)

1. Explain in detail about Storm water management and Integrated Urban Water Shed Management the in urban areas.
2. Discuss in detail about the Urban Geology and its characteristics.

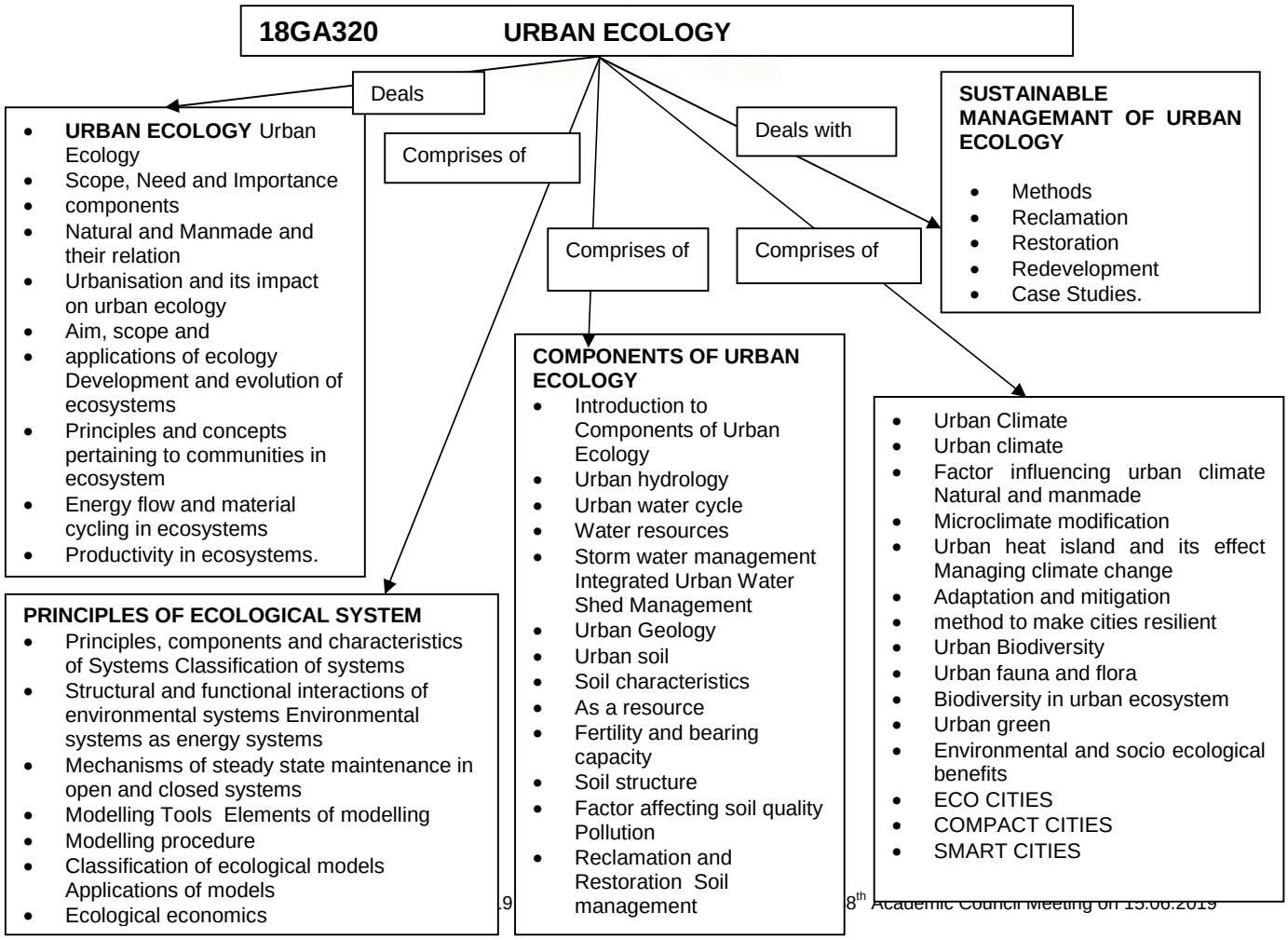
Course Outcome 5 (CO5)

1. Explain in detail about the Urban climate, Factor influencing urban climate, Natural and manmade climate.
2. Discuss in detail about urban heat island and its effect, Managing climate change and its Adaptation and mitigation.

Course Outcome 6 (CO6)

1. Explain in detail about the relation of soils with hydrological aspects in urban areas.
2. Discuss in detail about the biodiversity in urban areas.

Concept Map



Syllabus

URBAN ECOLOGY - Urban Ecology - Outline - Slope - Need and Importance - Urban ecosystem - components - Natural and Manmade and their relation - Urbanisation and its impact on urban ecology – Aim, scope and applications of ecology - Development and evolution of ecosystems - Principles and concepts pertaining to communities in ecosystem - Energy flow and material cycling in ecosystems - productivity in ecosystems - **PRINCIPLES OF ECOLOGICAL SYSTEM** - Principles, components and characteristics of Systems - Classification of systems - Structural and functional interactions of environmental systems - Environmental systems as energy systems - Mechanisms of steady-state maintenance in open and closed systems - Modelling Tools - Elements of modelling - Modelling procedure - Classification of ecological models - Applications of models - Ecological economics – **COMPONENTS OF URBAN ECOLOGY** – Introduction to Components of Urban Ecology - Urban hydrology - Urban water cycle - Water resources - Storm water management - Intergrated Urban Water Shed Management – Urban Geology - Urban soil - Soil characteristics - As a resource - Fertility and bearing capacity - Soil structure - Factor affecting soil quality - Pollution - Reclamation and Restoration - Soil management – Urban Climate - Urban climate - Factor influencing urban climate - Natural and manmade - Microclimate modification - Urban heat island and its effect - Managing climate change - Adaptation and mitigation – method to make cities resilent – Urban Biodiversity - Urban fauna and flora - Biodiversity in urban ecosystem - Urban green - Environmental and socio ecological benefits – ECO CITIES – COMPACT CITIES – SMART CITIES – **SUSTAINABLE MANAGEMANT OF URBAN ECOLOGY –** Methods – Reclamation – Restoration – Redevelopment – Case Studies.

References

1. Ian. L. McHarg, Design with Nature, American Museum of Natural History, National History Press, 1969.
2. Donald Watson, Michael J. Crosbie and John Hancock Callender, Time-Saver Standards for Architectural Design Data, Mcgraw – Hill International Editions, 1997.
3. Steven, S (2004) Site Engineering for Landscape Architects, John Wiley and Sons Inc .
4. Wood, M.L. (1993) Landscape Detailing Vol. I – IV Architectural Press.
5. Kangas, P.C. and Kangas, P., “Ecological Engineering: Principles and Practice”, Lewis Publishers, New York. 2003.
6. Etnier, C. and Guterstam, B., “Ecological Engineering for Wastewater Treatment”, Lewis Publishers, New York. 2007.
7. White, I.D., Mottershed, D.N. and Harrison, S.J., “Environmental Systems - An Introductory Text”, Chapman Hall, London. 2004.
8. Mitsch, J.W. and Jorgensen, S.E., “Ecological Engineering - An Introduction to Ecotechnology”, John Wiley & Sons, New York. 2009.

Course Contents and Lecture Schedule

S.No.	Topic	No. of lectures
1.	**URBAN ECOLOGY**	**9**
1.1	Urban Ecology, Outline, Slope, Need and Importance	2
1.2	Urban ecosystem, components, Natural and Manmade and their relation	2
1.3	Urbanisation and its impact on urban ecology, Aim, scope and applications of ecology, Development and evolution of ecosystems	2
1.4	Principles and concepts pertaining to communities in ecosystem, Energy flow and material cycling in ecosystems, productivity in ecosystems.	3
2.	**PRINCIPLES OF ECOLOGICAL SYSTEM**	**10**
2.1	Principles, components and characteristics of Systems, Classification of systems.	2
2.2	Structural and functional interactions of environmental systems, Environmental systems as energy systems.	2
2.3	Mechanisms of steady-state maintenance in open and closed systems,	2

	Modelling Tools.	
2.4	Elements of modelling, Modelling procedure.	2
2.5	Classification of ecological models, Applications of models, Ecological economics.	2
3.	**COMPONENTS OF URBAN ECOLOGY**	**14**
3.1	Introduction to Components of Urban Ecology, Urban hydrology, Urban water cycle, Water resources, Storm water management, Integrated Urban Water Shed Management.	3
3.2	Urban Geology , Urban soil, Soil characteristics , As a resource Fertility and bearing capacity, Soil structure, Factor affecting soil quality , Pollution - Reclamation and Restoration , Soil management .	3
3.3	Urban Climate, Urban climate, Factor influencing urban climate, Natural and manmade, Microclimate modification, Urban heat island and its effect, Managing climate change.	4
3.4	Adaptation and mitigation, method to make cities resilient, Urban Biodiversity, Urban fauna and flora, Biodiversity in urban ecosystem, Urban green, Environmental and socio ecological benefits, ECO CITIES, COMPACT CITIES, SMART CITIES.	4
4.	**SUSTAINABLE MANAGEMANT OF URBAN ECOLOGY –**	**12**
4.1	Methods, Reclamation.	**3**
4.2	Restoration, Redevelopment.	3
4.3	Case Studies.	6
TOTAL NO OF HOURS		**45**

Course Designers:

1. Dr.Jinu Loushidha Kitchley - hodarch@tce.edu
2. Prof.S.Karthikeyaraja - skrarch@tce.edu
3. Ar.S.Santhana Iyyappa Sundararaj - pothi@tce.edu
4. Ar.S.Aarthi Maila Devi - samdarch@tce.edu

PROGRAM CORE COURSES

A. ARCHITECTURE

(STUDIO)

18GA150	INTEGRATED ARCHITECTURAL DESIGN STUDIO I	Category	L	T	P	C
		PC	0	0	12	6

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Acquisition of knowledge on the methodology of data collection, consolidation, analyses and synthesis.	Understand
CO2	To engage in architectural design in the context of the city, related to Pubic Architecture. To gain knowledge in Explorative solutions based on real world problems.	Analyze
CO3	Analyze a design question and formulate the problem, to evolve a design solution for an architectural programme as a response to the man, context, culture, concern to environment, developments in building industry, changing trends of contemporary architectural practices, etc.,	Analyze
CO4	Proficiency in presentation of idea through manual / 2D computer aided drafting.	Apply

Mapping with Programme Outcomes

S- Strong; M-Medium; L-Low

Cos	PO1	PO2	PO3	PO4
CO1	**S**	**L**	**L**	**M**
CO2	**S**	**L**	**L**	**L**
CO3	**S**	**L**	**L**	**L**
CO4	**M**	**L**	**L**	**L**

Course Level Assessment Questions

NOT APPLICABLE

18GA230	INTEGRATED ARCHITECTURAL DESIGN STUDIO II	Category	L	T	P	C
		PC	0	0	12	6

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Acquisition of knowledge on the methodology of data collection, consolidation, analyses and synthesis.	Understand
CO2	To engage in architectural design in the context of the city, related to Pubic Architecture. Acquisition of knowledge in design and operations of sustainable built environments.	Analyze
CO3	Proficiency in presentation of idea through manual / 2D computer aided drafting.	Analyze

Mapping with Programme Outcomes

S- Strong; M-Medium; L-Low

Cos	PO1	PO2	PO3	PO4
CO1	**S**	**L**	**L**	**M**
CO2	**S**	**L**	**L**	**L**
CO3	**S**	**L**	**L**	**L**

Course Level Assessment Questions

NOT APPLICABLE

18GA330 **DISSERTATION**

Category	L	T	P	C
PC	0	0	10	5

Preamble

Dissertation offers an opportunity to understand architecture, history and design primarily through research. It is also intended to enlighten students on the fundamentals of research in Architecture and its significance in Architectural Practice. Further the course provides an opportunity for the student to carry out investigations on the selected area of study covering various aspects related to architecture and to demonstrate the research quantitatively/ qualitatively in a specific area.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Acquire Knowledge of research methodology and get updated in Research Methods.	**Understand**
CO2	Analyse varied specializations related to Architecture and allied fields and apply in their projects.	**Analyse**
CO3	Apply the Knowledge of documentation and technical writing.	**Apply**
CO4	Apply and Exhibit proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.	**Apply**
CO5	Analyse the societal issues and to evolve a solution for the identified issues.	**Create**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	**S**	**M**	**L**	**M**
CO2	**M**	**S**	**M**	**L**
CO3	**S**	**S**	**S**	**S**
CO4	**M**	**S**	**M**	**M**
CO5	**S**	**M**	**S**	**M**

S- Strong; M-Medium; L-Low

Course Level Assessment Questions

NOT APPLICABLE

Syllabus

The students are expected to study/document / analyse in detail a chosen area of their research interest. The topics may range from analyzing the recent trends in architectural researches, building performances, urban design, urban renewal, urban ecology, disaster management, landscape design, climate change adaptation, and digital tools in architectural design, design process, architectural theory and many more. The student is expected to demonstrate their research in a specific area and quantitatively/qualitatively evaluate their proposal/ design / solution. The topic will have to be approved at the end of the previous semester and reviewed periodically by a jury. A dissertation could also be a Thesis preparation course and gives the student scope for independent study and opportunity to explore specific area of interest which will form the basis of his/ her design thesis project in the next semester.

Books

1. Iain Borden and Kaaterina Ruedi; The Dissertation: An Architecture Student's Handbook; Architectural Press; 2000.
2. Turabian's A Manual for Writers of Research Papers, Theses, and Dissertations [7th edition]

3. John W Creswell; Research design: Qualitative, Quantitative and Mixed Methods Approaches;
4. Linda Grant and David Wang, Architectural Research Methods, John Wiley Sons 2001.
5. Ranjith Kumar; Research Methodology- A step by step guide for beginners; Sage Publications; 2005. Sage Publications; 2002.
6. Wayne C Booth; Joseph M Williams; Gregory G. Colomb; The Craft of Research, 2nd Edition; Chicago guides to writing, editing and publishing.
7. How Designers Think. The Design Process Demystified, Bryan Lawson,
8. Naturalistic Inquiry by Yvonna S. Lincoln, Egon G. Guba, SAGE, 1985
9. The Landscape of Qualitative Research: Theories and Issues, Norman K. Denzin, Yvonna S. Lincoln, SAGE Publications, 13-Feb-2003 - Social Science - 684 pages

TOTAL NO OF HOURS **150**

Course Designers:

1. Dr.Jinu L Kitchley - hodarch@tce.edu
2. Dr.I.Chandramathy - cmarch@tce.edu
3. Ar.R.Meena Kumari - rmiarch@tce.edu

18GA410 ARCHITECTURAL THESIS

Category	L	T	P	C
PC	0	0	20	10

Preamble

The course provides an opportunity to utilize knowledge and skills they have acquired through integrated architectural design process during previous semester and to engage the interests and skills the student bring with them to the program in order to allow them to become an authority in their chosen area of study.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course,

CO1	Students shall be able to synthesize the areas of knowledge, skills and techniques acquired in the various courses of the previous semesters through integrated architectural design processes.	Understand
CO2	Students would be able to integrate various contemporary/ advanced issues and techniques into the architectural design process.	Analyze
CO3	Analyze a design question and formulate the problem, to evolve a design solution for an architectural programme as a response to the man, context, culture, concern to environment, developments in building industry, changing trends of contemporary architectural practices, etc.,	Analyze
CO4	Students would be able to identify and go in depth into specific and appropriate aspects relating to the discipline of architecture and reflect this in the realm of design.	Analyze
CO5	Evolve a design solution for an architectural programme involving multi level planning with complex circulation, having large span structure, complex site planning.	Create
CO6	Proficiency in presentation of idea through manual / 2D computer aided drafting.	Apply

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	M	L	M
CO2	M	S	M	L
CO3	S	S	S	S
CO4	M	S	M	M
CO5	S	M	S	M
CO6	S	M	S	M

S- Strong; M-Medium; L-Low

Course Level Assessment Questions

NOT APPLICABLE

Syllabus

Thesis shall be a design project with a strong research component / shall extend as a research providing solution to the issue analysed in the dissertation. The scale of the project could extend from a design of a built environment (individual site to settlement level) to framing of guidelines/strategies for the issues identified, analysed in the fields of Urban design, Climate change, Conservation, etc. The initial process shall be rigorous, incorporating background

research on the topic, case studies, documentation of project issues, context, site and building information, programming, Townscape plans and future prospect, Renewal and rehabilitation programme in the core-inner city areas, Town's retrieval and regulatory control, Zoning studies and procedures for implementation. The process would culminate in design interventions at scales appropriate to the topic. The project shall desirably have the potential to serve as a starting point for practice and/ or further research. Students will submit a detailed proposal on their topic of interest(s). The Proposal shall be approved by the thesis review committee. The thesis project will be reviewed periodically by the review committee. At the end of the semester, the final thesis will be submitted and presented through a viva voce examination before a jury.

Books

1. Linda Grant and David Wang, "Architectural Research Methods", John Wiley Sons, 2002
2. Turabian's A Manual for Writers of Research Papers, Theses, and Dissertations [7th edition]
3. MLA Handbook for Writers of Research Papers [7th edition]
4. Donald Appleyard, "The Conservation of European Cities", M.I.T. Press, Massachusetts, 1979
5. Richard Kintermann and Robert, "Small Site Planning for Cluster Housing", Van Nostrand Reinhold Company, London/New York 1977
6. Miller T.G. Jr., "Environmental Sciences", Wadsworth Publishing Co., 1994
7. Geoffrey and Susan Jellico, "The Landscape of Man", Thames And Hudson, 1987
8. Arvind Krishnan & Others, " Climate Responsive Architecture", A Design Handbook for Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2007

TOTAL NO OF HOURS **300**

Course Designers:

1. Dr.Jinu L Kitchley - hodarch@tce.edu
2. Dr.I.Chandramathy - cmarch@tce.edu
3. Ar.R.Meena Kumari - rmiarch@tce.edu

ELECTIVE FOUNDATION COURSES
A. ARCHITECTURE
(THEORY)

18GAFB0 SUSTAINABLE WATER MANAGEMENT

Category	L	T	P	C
EFC	3	0	0	3

Preamble

To introduce concepts of water management from traditional settlements. To expose the students towards the water management practices and their importance at macro, micro and built form level.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Develop the knowledge water management techniques in Ancient periods.	Understand
CO2	Analyze the water management at macro level and micro Level.	Analyse
CO3	Apply the obtained knowledge in the area of water management at building level and site level.	Apply, Analyse and Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PEO1	PEO2	PEO3
CO1	L	L	L	L	M	M	M
CO2	S	M	M	L	M	L	M
CO3	M	S	S	S	S	S	S

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Understand	20	20
Apply	40	40
Analyse	20	20
Create	20	20

Course Level Assessment Questions

Course Outcome 1 (CO1)**:**

1. What are the traditional water management practices followed in various climatic zones of the world?
2. Explain the Traditional Architecture of wells in different parts of India through case examples.

Course Outcome 2 (CO2)

1. Analyse the principles of sustainable watershed development and give suggestions for Planning of settlements and large campuses?

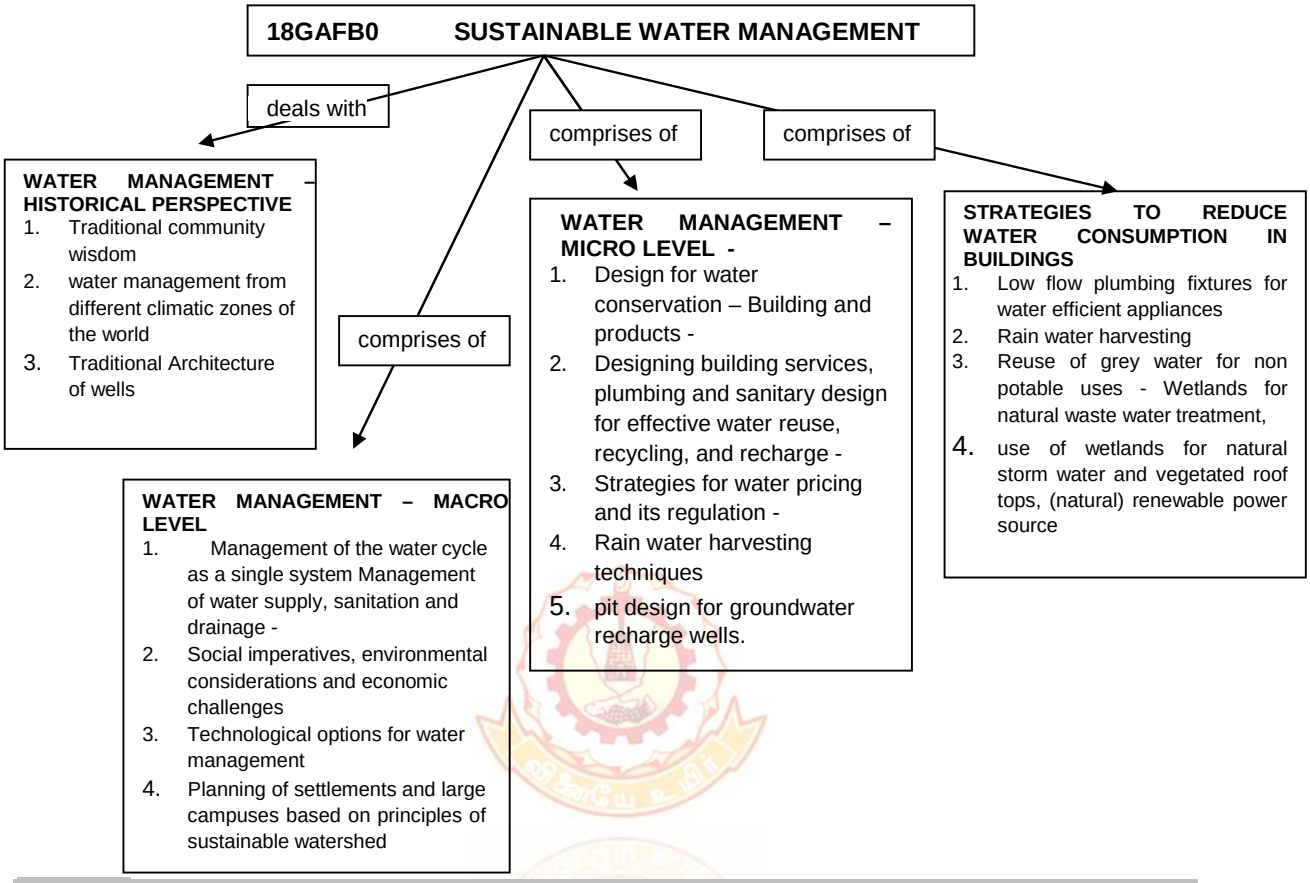
2. Analyse the Management of water supply, sanitation and drainage for large campuses.
3.Analyse the various Rain water harvesting techniques that can be applied for buildings

Course Outcome 3 (CO3)

1. What are the methods of Reuse of grey water?

2. What are the various natural waste water treatment methods?

Concept Map



Syllabus

WATER MANAGEMENT – HISTORICAL PERSPECTIVE - Traditional community wisdom regarding water management from different climatic zones of the world - Traditional Architecture of wells in Rajasthan, Gujarat, Tamilnadu – Stepped Wells, Baoris, Tankas, etc. WATER MANAGEMENT – MACRO LEVEL - Management of the water cycle as a single system - Management of water supply, sanitation and drainage - Social imperatives, environmental considerations and economic challenges - Technological options for water management, recycling, reuse, conservation and treatment - Planning of settlements and large campuses based on principles of sustainable watershed development with water as a priority resource. WATER MANAGEMENT – MICRO LEVEL -Design for water conservation – Building and products - Designing building services, plumbing and sanitary design for effective water reuse, recycling, and recharge - Strategies for water pricing and its regulation - Rain water harvesting techniques – Basic Concepts, piping techniques and pit design for groundwater recharge wells. STRATEGIES TO REDUCE WATER CONSUMPTION IN BUILDINGS-Low flow plumbing fixtures for water efficient appliances - Rain water harvesting - Reuse of grey water for non potable uses - Wetlands for natural waste water treatment, use of wetlands for natural storm water and vegetated roof tops, (natural) renewable power source such as photo voltaic, solar hot water fuel cells etc.

References

1. John Briscoe, R.P.S. Malik(Ed.), Handbook of Water Resources in India: Development, Management, and Strategies, Oxford University Press, 2007
2. Ramaswamy R. Iyer, Water and the laws in India, Sage Publications India Pvt. Ltd, 2009
3. Hydrology and Water Resources of India, Water Science and Technology Library, Vol. 57, Jain, Sharad K., Agarwal, Pushpendra K., Singh, Vijay P. Springer,2007
4. Guy Honore(Ed.), Principles and Practices of Integrated Watershed Management

in India, Indo-German Bilateral Project, 2002

5. K. Nageswara (Ed.), Water Resources Management: Realities and Challenges, Eastern Book Corpn., 2006
6. Dr B C Punmia, Ashok Kr Jain, Arun Kr Jain; Water Supply Engineering, Laxmi, Cunliffe, D. (ed) (2011), Water safety in buildings, World Health Organization, Geneva, Switzerland, 2011
7. P.K. Singh, Rainwater Harvesting: Low cost indigenous and innovative technologies, Macmillan Publishers India, 2008 8. R.N. Athavale , Water Harvesting And Sustainable Supply In India, Rawat Publications, 2003

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2. http://wrmin.nic.in 3. http://www.unicef.org/india/Final_Report.pdf

Course Contents and Lecture Schedule

S.No.	Topic	No. of lectures
1	**WATER MANAGEMENT – HISTORICAL PERSPECTIVE**	9
1.1	Traditional community wisdom regarding water management from different climatic zones of the world -	
1.2	Traditional Architecture of wells in Rajasthan, Gujarat, Tamilnadu – Stepped Wells, Baoris, Tankas, etc.	
2	**WATER MANAGEMENT – MACRO LEVEL**	**12**
2.1	Management of the water cycle as a single system - Management of water supply, sanitation and drainage	
2.2	Social imperatives, environmental considerations and economic challenges	
2.3	Technological options for water management, recycling, reuse, conservation and treatment	
2.4	Planning of settlements and large campuses based on principles of sustainable watershed development with water as a priority resource	
3	**WATER MANAGEMENT – MICRO LEVEL** **Design for water conservation – Building and products**	**12**
3.1	Designing building services, plumbing and sanitary design for effective water reuse, recycling, and recharge	
3.2	Strategies for water pricing and its regulation - Rain water harvesting techniques	
3.3	Basic Concepts, piping techniques and pit design for groundwater recharge wells.	
4	**STRATEGIES TO REDUCE WATER CONSUMPTION IN BUILDINGS**	12
4.1	Low flow plumbing fixtures for water efficient appliances	
4.2	Rain water harvesting - Reuse of grey water for non potable uses -	
4.3	Wetlands for natural waste water treatment, use of wetlands for natural storm water and vegetated roof tops, (natural) renewable power source such as photo voltaic, solar hot water fuel cells etc.	

TOTAL NO OF HOURS **45**

Course Designers:

1. Dr.A.Madhumathi - madhu@tce.edu
2. Ar. S.Santhana Iyyappa Sundararaj - pothi@tce.edu

		Category	L	T	P	C
18GAFC0	**URBAN TRANSPORT AND POLICY**	EFC	3	0	0	3

Preamble

This course introduces the fundamentals of urban transportation planning and the types of skills. This course imparts knowledge that transportation planners need. It further familiarizes students with contemporary transportation planning issues and methods of analysis. This course provides an oppurtunity to study the relationships between transportation and urban land use systems and new tools to address environmental and quality of life impacts of transportation.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Understand the transportation policy in the economic development of nations, theory and practice and its role in Urban planning	**Understand**
CO2	Analyse the **Travel Demand issues and supply planning** related to Urban Transportation policy	**Analyse**
CO3	Analyse the Transport's Role in tackling Social Inclusion, Economic Impacts of Transport Policy	**Analyse**
CO4	To apply the concepts of urban transportation Networks	**Apply**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	**M**	**S**	**L**	**S**
CO2	**M**	**S**	**L**	**S**
CO3	**S**	**S**	**S**	**S**
CO4	**S**	**S**	**S**	**S**

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Understand	**20**	**20**
Apply	**40**	**40**
Analyse	**40**	**40**

Course Level Assessment Questions

Course Outcome 1 (CO1):

1. Identify the urban transportation planning and its problems in the developing world.

(Understand)

Course Outcome 2 (CO2):

1. Analyse the **Travel Demand issues and supply planning** related to Urban Transportation policy

(Analyse)

Course Outcome 3 (CO3):

1. Categorize the Transport's Role in tackling Social Inclusion, Economic Impacts of Transport Policy

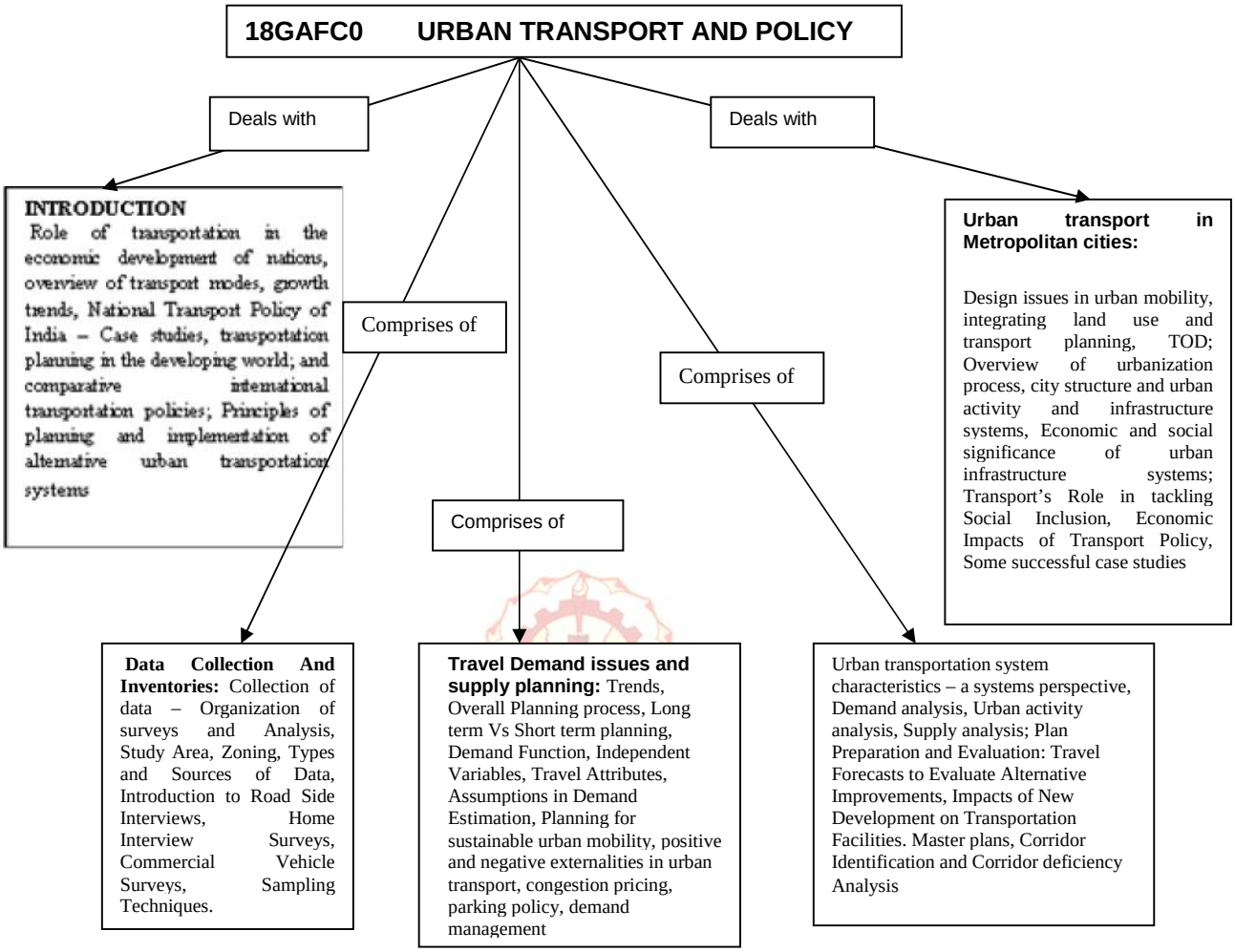
(Analyse)

Course Outcome 4 (CO4):

1. Illustrate the Economic Impacts of Transport Policy, Some successful case studies.

(Apply)

Concept Map



Syllabus

Introduction - Role of transportation in the economic development of nations, overview of transport modes, growth trends, National Transport Policy of India – Case studies, transportation planning in the developing world; and comparative international transportation policies; Principles of planning and implementation of alternative urban transportation systems - **Data Collection And Inventories:** Collection of data – Organization of surveys and Analysis, Study Area, Zoning, Types and Sources of Data, Introduction to Road Side Interviews, Home Interview Surveys, Commercial Vehicle Surveys, Sampling Techniques - **Travel Demand issues and supply planning:** Trends, Overall Planning process, Long term Vs Short term planning, Demand Function, Independent Variables, Travel Attributes, Assumptions in Demand Estimation, Planning for sustainable urban mobility, positive and negative externalities in urban transport, congestion pricing, parking policy, demand management - **Urban transportation system characteristics** – a systems perspective, Demand analysis, Urban activity analysis, Supply analysis; Plan Preparation and Evaluation: Travel Forecasts to Evaluate Alternative Improvements, Impacts of New Development on Transportation Facilities, Master plans, Corridor Identification and Corridor deficiency Analysis**- Urban transport in Metropolitan cities:** Design issues in urban mobility, integrating land use and transport planning, TOD; Overview of urbanization process, city structure and urban activity and infrastructure systems, Economic and social significance of urban infrastructure systems; Transport's Role in tackling Social Inclusion, Economic Impacts of Transport Policy, Some successful case studies

References

1. Introduction to Transportation Planning – M.J.Bruton; Hutchinson of London Ltd.
2. Introduction to Urban System Planning –B.G. Hutchinson; McGraw Hill.
3. Traffic Engineering and Transport Planning –Kadiyali L.R., Khanna Publishers
4. Lecture notes on UTP – Prof. S. Raghavachari, R.E.C.Warangal.
5. Metropolitan transportation planning – John W. Dickey, Tata McGraw Hill, New Delhi, 1975.

Course Contents and Lecture Schedule

S.No.	Topic	No. of lectures
1	**INTRODUCTION**	**9**
1.1	Role of transportation in the economic development of nations, overview of transport modes, growth trends, National Transport Policy of India – Case studies	3
1.2	Transportation planning in the developing world; and comparative international transportation policies	3
1.3	Principles of planning and implementation of alternative urban transportation systems.	3
2	**Data Collection And Inventories**	**7**
2.1	Collection of data – Organization of surveys and Analysis, Study Area, Zoning, Types and Sources of Data,	3
2.2	Introduction to Road Side Interviews, Home Interview Surveys, Commercial Vehicle Surveys, Sampling Techniques.	4
3	**Travel Demand issues and supply planning:**	**10**
3.1	Trends, Overall Planning process, Long term Vs Short term planning, Demand Function, Independent Variables, Travel Attributes, Assumptions in Demand Estimation,	6
3.2	Planning for sustainable urban mobility, positive and negative externalities in urban transport, congestion pricing, parking policy, demand management	4
4	**Urban transportation system characteristics**	**9**
4.1	Urban transportation Systems perspective, Demand analysis, Urban activity analysis, Supply analysis;	3
4.2	Plan Preparation and Evaluation: Travel Forecasts to Evaluate Alternative Improvements	2
4.3	Impacts of New Development on Transportation Facilities, Master plans, Corridor Identification and Corridor deficiency Analysis	4
5	**Urban transport in Metropolitan cities**	**10**
5.1	Design issues in urban mobility, integrating land use and transport planning, TOD	2
5.2	Overview of urbanization process, city structure and urban activity and infrastructure systems,	2
5.3	Economic and social significance of urban infrastructure systems;	2
5.3	Transport's Role in tackling Social Inclusion, Economic Impacts of Transport Policy, Some successful case studies.	4
TOTAL NO OF HOURS		**45**

Course Designers:

1. Ar.G.Balaji - gbarch@tce.edu
2. Ar.M.Shanmathi - msiarch@tce.edu

18GAFD0 EMERGING PRACTICES IN HOUSING Category L T P C

EFC 3 0 0 3

Preamble

This course in intended to expose the issues concerning housing in the Indian Context and the various agencies involved in the production of housing. It outlines the factors that influence housing affordability and familiarizes students with various schemes and policies of the government in the housing sector. The course will inform about the standards and guidelines for housing and the various housing design typologies and the processes involves in housing project development, Mass Housing Project in Urban areas or Smart cities.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	The planning process, theory and practice and its role in Housing planning, with examples.	**Remember**
CO2	To have profound knowledge about the historical development of housing and the importance of cultural inferences	**Remember**
CO3	The typologies of housing in relation to culture and environment factors.	**Understand**
CO4	Approach spatial & regional designs with help of diagrams, geometry and surface parameters.	**Analyse**
CO5	The housing sectors as an integral part of overall town planning system have a basic understanding of housing at the neighbourhood and City Level.	**Analyse**
CO6	Comprehend the environmental impact of materials and technologies and evaluation criteria like LEEDS, etc.	**Apply**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	M	L	M
CO2	M	S	M	L
CO3	S	S	S	S
CO4	M	S	M	M
CO5	S	M	S	M
CO6	M	S	M	S

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Remember	10	10
Understand	10	10
Apply	40	40
Analyse	40	40

Course Level Assessment Questions

Course Outcome 1 (CO1)**:**

1. Mention the key features of site analysis in a housing project.
2. List the various factors affecting Housing Design.

Course Outcome 2 (CO2):

1. Brief the objectives UN-HABITAT - The right to adequate housing.
2. Discus about the various types of approval requires for urban housing.

Course Outcome 3 (CO3):

1. Elaborate on the objectives and strategies of the National Housing and Habitat Policy in India.
2. Discus about the Slum Housing Programme and Projects in Indian context.

Course Outcome 4 (CO4):

1. Explain the concept of micro financing in housing sector.
2. Explain the objectives and contents of any one housing law in any one state in India.

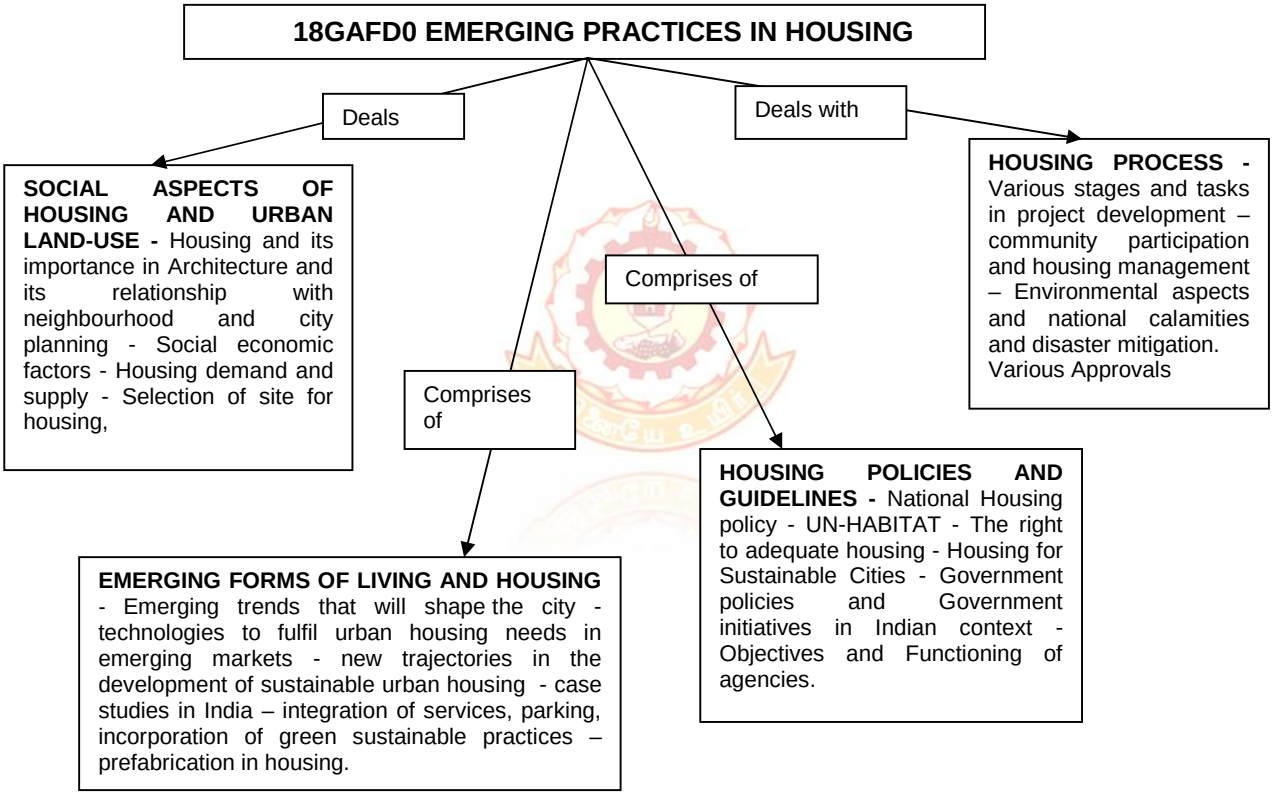
Course Outcome 5 (CO5):

1. Suggest suitable measure for housing in disaster prone areas.
2. Explain about the urban land ceiling and regulation act.

Course Outcome 6 (CO6):

1. Explain the provisions of development control regulations pertaining, in any one metropolitan city in India.
2. Compare and contrast between housing program and housing project.

Concept Map



Syllabus

SOCIAL ASPECTS OF HOUSING AND URBAN LAND-USE - Housing and its importance in Architecture and its relationship with neighbourhood and city planning - Social economic factors influencing housing affordability – equity in housing development sites and services/-slum up gradation community participation - Housing demand and supply - Selection of site for housing, consideration of physical characteristics of site. **EMERGING FORMS OF LIVING AND HOUSING** -Emerging trends that will shape the city - technologies to fulfill urban housing needs in emerging markets - New trajectories in the development of sustainable urban housing -contemporary trends - constantly evolving to reflect the popular styles - Case studies - Integration of services, parking, incorporation of green sustainable practices –prefabrication in housing.. - **HOUSING POLICIES AND GUIDELINES** - National Housing policy - UN-HABITAT - The right to adequate housing - Housing for Sustainable Cities - Government policies and Government initiatives in Indian context - objectives and Functioning of agencies - Urban Poverty Alleviation Programme (BUPP) / NGO‘s / Self-help housing – AWAS, Public Private partnership model - HUDCO‘s innovative - **HOUSING PROCESS** - Various stages and tasks in project development – community participation and housing management – Environmental aspects and national calamities and disaster mitigation - Various Approvals - Various types of approval requires for urban housing or Mass Housing – Various concern authorities, [Like Non agriculture permission, Legal - Revenue permission, Construction approval, NOC from various Government Department like Railway, Air Port, Archeological etc.…]

References

1. Christopher Alexander, A Pattern Language, Oxford University Press, New York - 1977.
2. Joseph de chiara & others - Time Saver Standards for Housing and Residential development, McGraw Hill Co., New York, 1995.
3. Richard Untermanu & Robert Small, Site Planning for Cluster Housing, Van Nostrand Reinhold Company, London/New York, 1977.
4. Forbes Davidson and Geoff Payne, Urban Projects Manual, Liverpool University Press, Liverpool, 1983.
5. HUDCO Publications - Housing for the Low income, Sector Model.

Course Contents and Lecture Schedule

S.No.	Topic	No. of lectures
1	**SOCIAL ASPECTS OF HOUSING AND URBAN LAND-USE**	**9**
1.1	Housing and its importance in Architecture and its relationship with neighbourhood and city planning.	2
1.2	Social economic factors influencing housing affordability.	2
1.3	Equity in housing development sites and services/-slum up gradation community participation.	2
1.4	Housing demand and supply - Selection of site for housing, consideration of physical characteristics of site.	3
2	**EMERGING FORMS OF LIVING AND HOUSING**	**12**
2.1	Emerging trends that will shape the city - technologies to fulfil urban housing needs in emerging markets - Hyper Housing-Multi-cultural Housing - lab rooms and cyber homes - Network housing - hybrid buildings - individual sheltered residences.	4
2.2	New trajectories in the development of sustainable urban housing - contemporary trends - constantly evolving to reflect the popular styles - Case studies .	4
2.3	Integration of services, parking, incorporation of green sustainable practices –prefabrication in housing.	4
3	**HOUSING POLICIES AND GUIDELINES**	**12**
3.1	National Housing policy - UN-HABITAT - The right to adequate housing.	4
3.2	Housing for Sustainable Cities - Government policies and Government initiatives in Indian context - objectives and Functioning of agencies	4
3.3	Urban Poverty Alleviation Programme (BUPP) / NGO‘s / Self-help housing – AWAS, Public Private partnership model - HUDCO‘s innovative.	4
4	**HOUSING PROCESS**	**12**
4.1	Various stages and tasks in project development – community participation and housing management – Environmental aspects and national calamities and disaster mitigation.	4
4.2	Environmental aspects and national calamities and disaster mitigation. Various Approvals - Various types of approval requires for urban housing or Mass Housing.	4
4.1	Various concern authorities, [Like Non agriculture permission, Legal - Revenue permission, Construction approval, NOC from various Government Department like Railway, Air Port, Archaeological etc.…]	4
TOTAL NO OF HOURS		**45**

Course Designers:

1. Ar.M.Sindhuja - crissindhu@tce.edu
2. Ar Jeyabalaji.R - jeyabalaji1991@gmail.com

18GAFE0 LIGHTING DESIGN FOR WORK ENVIRONMENT

Category	L	T	P	C
EFC	3	0	0	3

Preamble

This course is intended to expose the students about lighting design in work environment. It is imperative for the students to learn & understand lighting and its relationship with Environment by getting exposed to the current trends of Energy saving techniques.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Concepts and specification in Lighting design	**Remember**
CO2	To know the characteristics and applications of the different types of modern lamps and luminaries.	**Understand**
CO3	Gain knowledge of different methods of various issues related to Lighting.	**Understand**
CO4	To have a working knowledge of modern Control Systems for energy efficient lighting.	**Analyse**
CO5	Expose the relationship between Lighting and the Environment.	**Analyse**
CO6	Design lighting schemes taking both cost and quality considerations into account.	**Apply**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	**S**	**M**	**L**	**M**
CO2	**M**	**S**	**L**	**L**
CO3	**S**	**S**	**S**	**S**
CO4	**S**	**M**	**M**	**S**
CO5	**M**	**S**	**M**	**M**
CO6	**M**	**M**	**M**	**S**

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Remember	**10**	**10**
Understand	**10**	**10**
Apply	**40**	**40**
Analyse	**40**	**40**

Course Level Assessment Questions

Course Outcome 1 (CO1)

1. What are the factors governing illumination?
2. List the effect of lighting on health.

Course Outcome 2 (CO2)

1. Explain the colorimetric quantities and systems of lighting?
2. Describe the characteristics of Integration of electric light and daylight.

Course Outcome 3 (CO3)

1. Explain the Integrated ceiling system and heat recovery.
2. Explain about the power factor correction and harmonic compensation.

Course Outcome 4 (CO4)

1. Explain briefly on lighting shelves.
2. Describe the enhancement the lighting to visual environment.

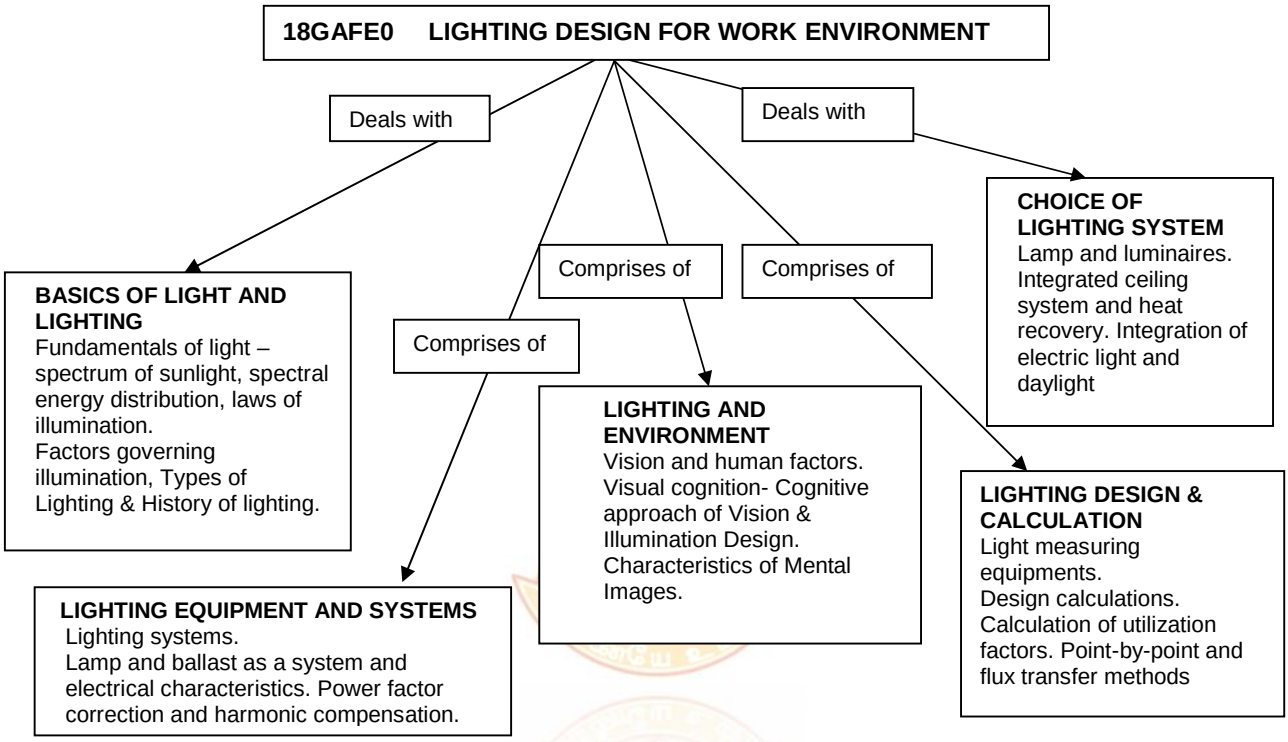
Course Outcome 5 (CO5)

1. Explain the luminance variations in a particular space or a time.
2. Describe the performance of colour which relates to the colour temperature of lamp.

Course Outcome6 (CO6)

1. Explain how visual stimuli are important.
2. Explain the cost and properties of high frequency fluorescent lamps.

Concept Map



Syllabus

BASICS OF LIGHT AND LIGHTING - Fundamentals of light – spectrum of sunlight, spectral energy distribution, laws of illumination, photometry and colorimetric quantities and systems. Eye and vision – visibility -visual acuity, visual activity, contrast sensitivity. Factors governing illumination –glare, diffusion, direction, composition, distribution, visual performance and lighting quality. Types of Lighting- day light, artificial lighting - History of lighting- Architects and lighting designers – Richard Kelly, Louis Kahn, Mies van der Rohe, Philip Johnson, Eero Saarinen,Jonathan Speirs and Mark Major, Claude R. Engle. **LIGHTING EQUIPMENT AND SYSTEMS** - Lighting systems – Incandescent lamps. Discharge lamps, Fluorescent lamps, LED, HID. Luminaries and control gear. Conventional and electronic ballasts. Lamp and ballast as a system and electrical characteristics. Power factor correction and harmonic compensation. **LIGHTING AND ENVIRONMENT** - Vision and human factors. Visual performance and its assessment. Lighting criteria. Effect of lighting on health, physiology of the circadian system, seasonal affective disorder (SAD), alertness, performance, and jet-lag. Visual cognition - Cognitive approach of Vision & Illumination Design-color vision, Measurement of Visual acuity , Aging Eye, Illumination at work, mental Image ability - Characteristics of Mental Images – Imagery and Rotation, size , angle, Shape , and Part -whole Relationship ,Imagery and Interference Imagery & Memory , Cognitive maps. **LIGHTING DESIGN & CALCULATION** - Light measuring equipments. Illuminance Meter, Luminance Meter, Lighting Software, Chroma Meter, Colour Analyser, Data Management Software, Design objectives and criteria. Design calculations: Illuminance due to point, line and area sources. Lumen method. Calculation of utilization factors. Point-by-point and flux transfer methods. **CHOICE OF LIGHTING SYSTEM** - Lamp and luminaires. Integrated ceiling system and heat recovery. Integration of electric light and daylight. Benefits-Energy Savings-Green House Gas Emission- Social Prospective- Deferred from Mercury- Clean disposal options-Discount-Rational Economic Factor- Pay Back Formula. Cost of Light- Energy Cost –Usage hours- Replacement Cost. Trade –off among alternative technology-Daily Lighting Load Curves- Annual Cost of White LED's-Better investment

References

1. Lighting design basics, Mark Karlen, James Benya , John Wiley and Sons
2. Architectural lighting design By Gary R. Steffy, John Wiley and Sons, 2002

3. Ergonomics and Health Aspects of Work with Computers: International Conference, EHAWC 2009, Held as Part of HCI International 2009, San Diego, CA, USA, July 19-24, 2009, Proceedings
4. Building technology:mechanical and electrical systems, Benjamin Stein, McGuinness, William J. John Wiley and Sons, 1997

Course Contents and Lecture Schedule

S.No	Topic	No. of lectures
1	**BASICS OF LIGHT AND LIGHTING**	**9**
1.1	Fundamentals of light – spectrum of sunlight, spectral energy distribution, laws of illumination.	3
1.2	Eye and vision – visibility -visual acuity, visual activity, contrast sensitivity	1
1.3	Factors governing illumination –glare, diffusion, direction, composition, distribution, visual performance and lighting quality. Types of Lighting- day light, artificial lighting	2
1.4	History of lighting- Architects and lighting designers – Richard Kelly, Louis Kahn, Mies van der Rohe, Philip Johnson, Eero Saarinen,Jonathan Speirs and Mark Major, Claude R. Engle.	3
2	**LIGHTING EQUIPMENT AND SYSTEMS**	**4**
2.1	Lighting systems – Incandescent lamps. Discharge lamps, Fluorescent lamps, LED, HID. Luminaries and control gear.	2
2.2	Conventional and electronic ballasts. Lamp and ballast as a system and electrical characteristics. Power factor correction and harmonic compensation.	2
3	**LIGHTING AND ENVIRONMENT**	**9**
3.1	Vision and human factors. Visual performance and its assessment. Lighting criteria. Effect of lighting on health, physiology of the circadian system, seasonal affective disorder (SAD), alertness, performance, and jet-lag	3
3.2	Visual cognition - Cognitive approach of Vision & Illumination Design-color vision, Measurement of Visual acuity , Aging Eye, Illumination at work, mental Image ability -	3
3.3	Characteristics of Mental Images – Imagery and Rotation, size , angle, Shape, and Part -whole Relationship ,Imagery and Interference Imagery & Memory, Cognitive maps.	3
4	**LIGHTING DESIGN & CALCULATION**	**8**
4.1	Light measuring equipments. Illuminance Meter, Luminance Meter, Lighting Software, Chroma Meter, Colour Analyser, Data Management Software, Design objectives and criteria.	4
4.2	Design calculations: Illuminance due to point, line and area sources. Lumen method. Calculation of utilization factors. Point-by-point and flux transfer methods	4
5	**CHOICE OF LIGHTING SYSTEM**	**15**
5.1	Lamp and luminaires. Integrated ceiling system and heat recovery. Integration of electric light and daylight.	3
5.2	Benefits-Energy Savings-Green House Gas Emission- Social Prospective-Deferred from Mercury- Clean disposal options-Discount-Rational Economic Factor- Pay Back Formula.	6
5.3	Cost of Light- Energy Cost –Usage hours- Replacement Cost. Trade –off among alternative technology-Daily Lighting Load Curves- Annual Cost of White LED's-Better investment	6
TOTAL NO OF HOURS		**45**

Course Designers:

1. Ar.M.Sindhuja - crissindhu@tce.edu
2. Ar Shalini Prasad - rspdarch@tce.edu

18GAFF0	LANDSCAPE CONSTRUCTION	Category	L	T	P	C
		EFC	3	0	0	3

Preamble

This course intended to expose the students with the understanding of the materials, methods techniques and specification pertaining to landscape construction involving hardscape softscape and aqua-scope elements. This course focuses about various landscape services and its integration into landscape design.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Acquire knowledge about landforms and apply his/her knowledge and skill in shaping the landform.	**Apply**
CO2	Acquire knowledge about landscape construction and apply his/her knowledge and skill in design and detailing of hard landscape construction.	**Apply**
CO3	Acquire knowledge about landscape construction and apply his/her knowledge and skill in design and detailing of soft landscape construction.	**Apply**
CO4	Acquire knowledge about landscape construction and apply his/her knowledge and skill in design and detailing of landscape construction for aquascapes.	**Apply**
CO5	Analyze the context and identify the choice of material, methods and techniques of construction with appropriate specifications.	**Analyse**
CO6	Analyse the context and integrate landscape services which is economical and efficient.	**Analyse**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	**S**	**L**	**M**	**M**
CO2	**S**	**L**	**S**	**M**
CO3	**S**	**L**	**S**	**M**
CO4	**S**	**L**	**S**	**M**
CO5	**S**	**M**	**L**	**M**
CO6	**S**	**M**	**L**	**M**

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Apply	**50**	**50**
Analyse	**50**	**50**

Course Level Assessment Questions

Course Outcome 1 (CO1)

1. Differentiate: Contours and Slope.
2. List the various materials used in Hardscape Elements.

Course Outcome 2 (CO2)

1. Explain the Visual and Structural Characteristics of Softscapes.

2. Explain the various components of Landscape Elements in Urban Context.

Course Outcome 3 (CO3)

1. Explain the application of integration of various services in landscape construction.
2. Discuss in detail about the application and integration of Softscapes, Hardscapes and Aquascapes in Landscape Construction.

Course Outcome 4 (CO4)

1. Explain the brief of application of Landscape Lighting and Landscape Irrigation in landscape construction.
2. Discuss in detail about the Design and Details of Aquascape elements like, Fountains, Cascades, Pools, Ponds etc and choice of materials method & technique of construction in Landscape Construction.

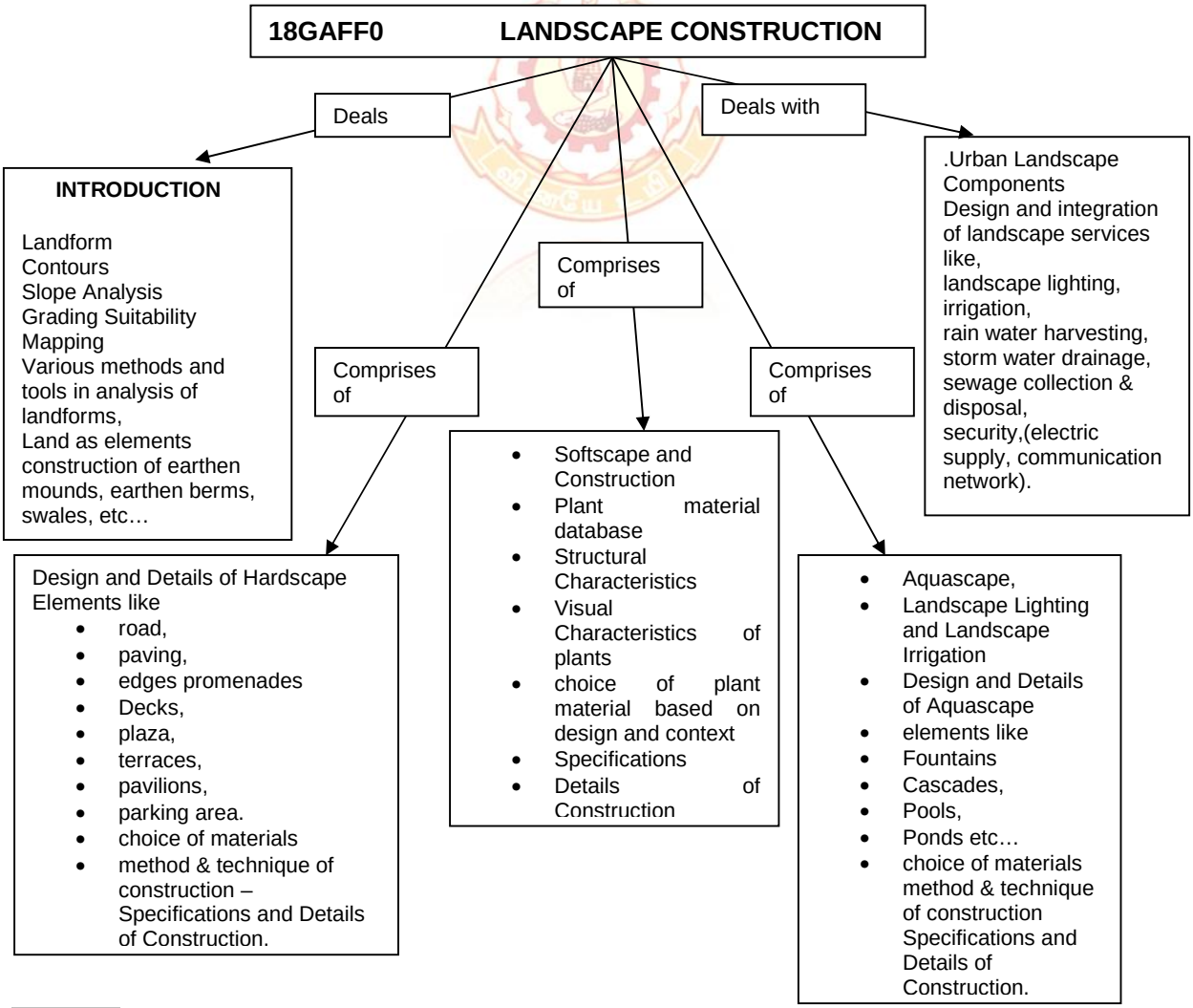
Course Outcome 5 (CO5)

1. Explain the brief of Urban landscape component in landscape construction.
2. Discuss in detail Design and integration of landscape services like, landscape lighting, irrigation, rain water harvesting, storm water drainage,

Course Outcome 6 (CO6)

1. Explain the brief of Urban landscape component in landscape construction.
2. Discuss in detail Design and integration of landscape services like sewage collection & disposal, security, (electric supply, communication network).

Concept Map



Syllabus

INTRODUCTION- Land and Landforms - Landform – Contours – Slope Analysis – Grading –Suitability Mapping – Various methods and tools in analysis of landforms, Land as elements – construction of earthen

mounds, earthen berms, swales, etc…**Hardscape and Construction** - Design and Details of Hardscape Elements like road, paving, edges promenades Decks, plaza, terraces, pavilions, – parking area.– choice of materials – method & technique of construction - Specifications and Details of Construction. **Softscape and Construction** - Plant material database – Structural and Visual Characteristics of plants – choice of plant material based on design and context – Specifications and Details of Construction. **Aquascape, Landscape Lighting and Landscape Irrigation** - Design and Details of Aquascape – elements like Fountains Cascades, Pools, Ponds etc… choice of materials – method & technique of construction – Specifications and Details of Construction. **Urban Landscape Components and Construction** - Design and integration of landscape services like, landscape lighting, irrigation, rain water harvesting, storm water drainage, sewage collection & disposal, security, (electric supply, communication network).

Course Contents and Lecture Schedule

S.No.	Topic	No. of lectures
1	**INTRODUCTION**	**6**
1.1	Introduction to land and Landform, Contours, Slope Analysis, Grading	2
1.2	Suitability Mapping, Various methods and tools in analysis of landforms	2
1.3	Land as elements construction of earthen mounds, earthen berms, swales, etc…	2
2	**Hardscape and Construction**	**9**
2.1	Design and Details of Hardscape Elements	2
2.2	road, paving, edges promenades Decks, plaza,	2
2.3	Terraces, pavilions, parking area.	2
2.4	Choice of materials – method & technique of construction – Specifications and Details of Construction.	3
3	**Softscape and Construction**	**10**
3.1	Plant material database,	3
3.2	Structural Characteristics and Visual Characteristics of plants	3
3.3	choice of plant material based on design	2
3.4	context – Specifications and Details of Construction	2
4	**Aquascape, Landscape Lighting and Landscape Irrigation**	**10**
4.1	Design and Details of Aquascape elements	3
4.2	Fountains Cascades, Pools, Ponds etc	3
4.3	Choice of materials – method & technique of construction – Specifications and Details of Construction.	4
5	**Urban Landscape Components and Construction**	**10**
5.1	Design and integration of landscape services like, landscape lighting, irrigation	5
5.2	Rain water harvesting, storm water drainage, sewage collection & disposal, security, (electric supply, communication network).	5

TOTAL NO OF HOURS **45**

References

1. Dines, C.W.H.N.T (2001) Time Saver standards for Landscape Architecture, Mc Graw Hill.
2. Hopper (n.d) Landscape graphic standards students, Ed. John Wiley and Sons Inc.
3. Reid, G.W (1987) Landscape graphics, Watson New York; Guptill Publication.
4. Sauter, D(2000) Landscape construction, Pelmer Thomson Learning.
5. Steven, S (2004) Site Engineering for Landscape Architects, John Wiley and Sons Inc .
6. Wood, M.L. (1993) Landscape Detailing Vol. I – IV Architectural Press.

Course Designers:

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3. Ar.S.Santhana Iyyappa Sundararaj - pothi@tce.edu

18GAFG0 ARCHITECTURAL PEDAGOGY

Category	L	T	P	C
EFC	3	0	0	3

Preamble

Pedagogy is an art and science of teaching and learning. The overall purpose of the course is to support each student to establish a personal, reflective, and examined intellectual position in relation to design as a process of inquiry, thought, and action. To introduce the importance of critical inquiry as a way of gaining knowledge and expose to the various forms of Instructional theories, methods and techniques. To engage this understanding in the specific field of Architectural Pedagogy through active learning and to delineate the balance and harmony of the skill-based and knowledge-based pedagogies that is crucially needed in the architectural education of the future.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	To understand the techniques of teaching in a specialized course like architecture and the various processes involved in Design.	**Understand**
CO2	Apply diversified skills like writing, investigating, speaking, drawing, and modelling to express /narrate architectural ideas	**Apply**
CO3	Apply the gained knowledge towards societal benefits to improve architectural education.	**Apply**
CO4	To analyse the role of Rubrics in the assessment of design process	**Analyse**
CO5	To analyze the gaps between skill-based and knowledge-based pedagogies in Architectural education and To analyze any syllabus keeping in mind the goal of the institution.	**Analyse**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	M	M	M	M
CO2	S	M	M	M
CO3	S	M	M	M
CO4	S	S	S	S
CO5	S	S	S	S

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Understand	**20**	**20**
Apply	**40**	**40**
Analyse	**40**	**40**

Course Level Assessment Questions

Course Outcome 1 (CO1)

1. Discuss in detail about analogies and metaphor in Architectural Design.
2. List out the skills a designer should possess.
3. Write in detail about the traps that an amateur designer might fall into. Quote examples.

Course Outcome 2 (CO2)

1. Analyse different instructional methods and suggest a suitable method for Architectural Pedagogy.
2. Discuss in detail the criteria for selecting a specific Instructional technique.

Course Outcome 3 (CO3)

1. Analyse how the discipline contribute to societal change.
2. Discuss in detail about the application of pedagogical theories and it principles in architectural education.

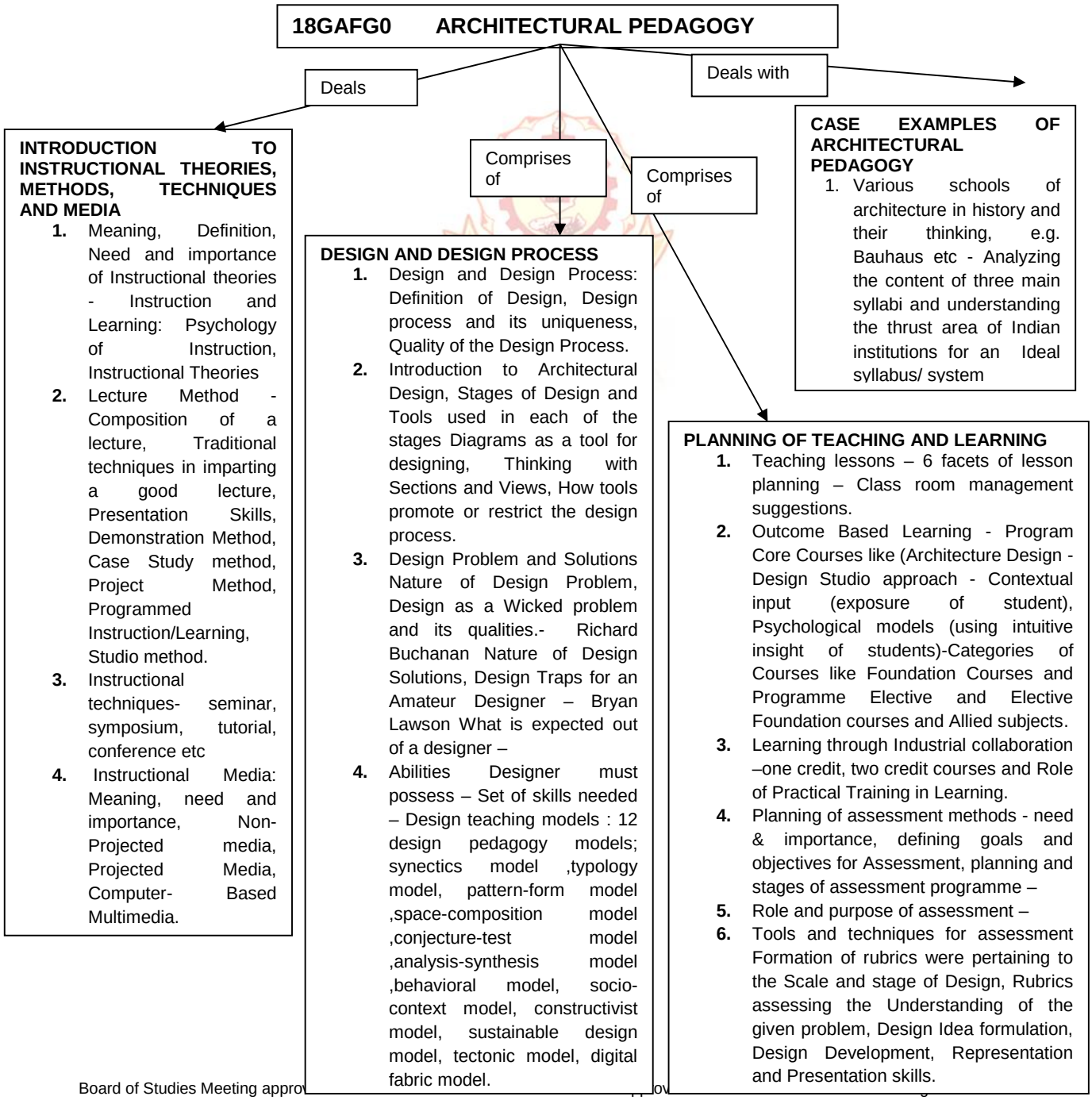
Course Outcome 4 (CO4)

1. Analyze the importance of design inquiry in Architecture.
2. Choose a Rubric for the assessment of any studio based subject and analyse the various parameters and stages of evaluation.

Course Outcome 5 (CO5)

1. Demonstrate information competence and the ability to use technology for pedagogical purposes.
2. Elucidate the different types of syllabus and the method of teaching with case examples.

Concept Map



Syllabus

Introduction to Instructional theories, Methods, techniques and Media: Meaning, Definition, Need and importance of Instructional theories - Instruction and Learning: Psychology of Instruction, Instructional Theories - Lecture Method - Composition of a lecture, Traditional techniques in imparting a good lecture, Presentation Skills, Demonstration Method, Case Study method, Project Method, Programmed Instruction/Learning, Studio method. Instructional techniques- seminar, symposium, tutorial, conference etc - Instructional Media: Meaning, need and importance, Non-Projected media, Projected Media, Computer- Based Multimedia. **Design and Design Process:** Definition of Design, Design process and its uniqueness, Quality of the Design Process. Introduction to Architectural Design, Stages of Design and Tools used in each of the stages Diagrams as a tool for designing, thinking with Sections and Views, How tools promote or restrict the design process. Design Problem and Solutions Nature of Design Problem, Design as a Wicked problem and its qualities.- Richard Buchanan Nature of Design Solutions, Design Traps for an Amateur Designer – Bryan Lawson What is expected out of a designer - Abilities Designer must possess – Set of skills needed – Design teaching models : 12 design pedagogy models; synectics model ,typology model, pattern-form model ,space-composition model ,conjecture-test model ,analysis-synthesis model, behavioural model, socio-context model, constructivist model, sustainable design model, tectonic model, digital fabric model. **Planning of teaching and Learning**: teaching lessons – 6 facets of lesson planning – Class room management suggestions .- Outcome Based Learning - Program Core Courses like (Architecture Design - Design Studio approach - Contextual input (exposure of student), Psychological models (using intuitive insight of students), Categories of Courses like Foundation Courses and Programme Elective and Elective Foundation courses and Allied subjects. Learning through Industrial collaboration –one credit, two credit courses and Role of Practical Training in Learning - Planning of assessment methods - need & importance, defining goals and objectives for Assessment, planning and stages of assessment programme - Role and purpose of assessment - Tools and techniques for assessment Formation of rubrics pertaining to the Scale and stage of Design, Rubrics assessing the Understanding of the given problem, Design Idea formulation, Design Development, Representation and Presentation skills. **Case examples of Architectural pedagogy** - Various schools of architecture in history and their thinking, e.g. Bauhaus etc - Analyzing the content of three main syllabi and understanding the thrust area of Indian institutions for an Ideal syllabus/ system

Text Books

1. Edward De Bono, Lateral Thinking.
2. Bryan Lawson – How Designer's Think, Architectural Press Ltd, London 1980.
3. Tom Health – Method in Architecture, John Wiley & Sons, New York, 1984.

References

1. Buchanan, R. (1992). Wicked Problems in Design Thinking. In Design Issues, Vol. 8, No. 2 spring, 1992), pp. 5-21.
2. Cross, N. (2001). Designerly Ways of Knowing: Design Discipline versus Design Science. Design Studies, 17(No.3), Summer 2001, 49-55
3. Transformative Pedagogy in Architecture and Urbanism by Ashraf M. Salama
4. Art, Architecture, Pedagogy Experiments in Learning by Ken Ehrlich
5. S. K. Mangal(2009)"Essential of educational technology", PHI Learning Pvt. Ltd., 2009.
6. Bruce Joyce and Marsha Weils, "Models of Teaching", Pearson; 9 edition (April 14, 2014)
7. Klausmier and Ripple (1971) "Learning and Human Abilities" Harper &Row, New York.
8. Eames Charles & Ray, "An Eames Anthology", Yale University Press, Edited by Ostroff Denial.

Course Contents and Lecture Schedule

S.No.	Topic	No. of lectures
1	**INTRODUCTION TO INSTRUCTIONAL THEORIES, METHODS, TECHNIQUES AND MEDIA**	12

1.1	Meaning, Definition, Need and importance of Instructional theories - Instruction and Learning: Psychology of Instruction, Instructional Theories	2
1.2	Lecture Method - Composition of a lecture, Traditional techniques in imparting a good lecture, Presentation Skills, Demonstration Method, Case Study method, Project Method, Programmed Instruction/Learning, Studio method.	4
1.3	Instructional techniques- seminar, symposium, tutorial, conference etc	2
1.4	Instructional Media: Meaning, need and importance, Non-Projected media, Projected Media, Computer- Based Multimedia.	4
2	**DESIGN PROCESS DESIGN PROBLEM AND SOLUTIONS**	**13**
2.1	Definition of Design, Design process and its uniqueness, Quality of the Design Process.	2
2.2	Introduction to Architectural Design, Stages of Design and Tools used in each of the stages Diagrams as a tool for designing, Thinking with Sections and Views, How tools promote or restrict the design process.	2
2.3	Design Problem and Solutions Nature of Design Problem, Design as a Wicked problem and its qualities.- Richard Buchanan Nature of Design Solutions, Design Traps for an Amateur Designer – Bryan Lawson	3
2.4	What is expected out of a designer - Abilities Designer must possess – Set of skills needed	2
2.5	Design teaching models : 12 design pedagogy models; synectics model, typology model, pattern-form model, space-composition model, conjecture-test model, analysis-synthesis model, behavioral model, socio-context model, constructivist model, sustainable design model, tectonic model, digital fabric model.	4
3	**PLANNING OF TEACHING AND LEARNING**	**12**
3.1	Teaching lessons – 6 facets of lesson planning – Class room management suggestions	2
3.2	Outcome Based Learning - Program Core Courses like (Architecture Design - Design Studio approach - Contextual input (exposure of student), Psychological models (using intuitive insight of students), Categories of courses like Foundation Courses ,Programme Elective and Elective Foundation courses and Allied subjects to.....	4
3.3	Learning through Industrial collaboration –one credit, two credit courses and Role of Practical Training in Learning.	2
3.4	Planning of assessment methods – need & importance, defining goals and objectives for Assessment, planning and stages of assessment programme	2
3.5	Role and purpose of assessment – Tools and techniques for assessment Formation of rubrics pertaining to the Scale and stage of Design, Rubrics assessing the Understanding of the given problem, Design Idea formulation, Design Development, Representation and Presentation skills.	2
4	**CASE EXAMPLES OF ARCHITECTURAL PEDAGOGY**	**8**
4.1	Various schools of architecture in history and their thinking, e.g. Bauhaus, CEPT, JJ School of Fine Arts, NIT, IIT etc	4
4.2	Analyzing the content of three main syllabi and understanding the thrust area of Indian institutions for an Ideal syllabus/ system	4

TOTAL NO OF HOURS **45**

Course Designers:

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PROGRAM ELECTIVE COURSES
A. ARCHITECTURE

(THEORY)

18GAPA0 DISASTER MITIGATION AND MANAGEMENT

Category	L	T	P	C
PE	3	0	0	3

Preamble

This course deals with the various disasters and to expose the students about the measures, its effect against built structures, and Hazard Assessment procedure in India. This course also deals with the methods of mitigating various hazards such that their impact on communities is reduced.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Acquire knowledge about the various types of disaster viz Hydrological, Coastal and Marine Disasters, Atmospheric Disasters, Geological, Mass Movement and Land Disasters, Wind and Water Driven Disasters	**Understand**
CO2	To identify the potential deficiencies of existing buildings for Earthquake disaster and suggest suitable remedial measures.	**Understand**
CO3	Derive the guide lines for the precautionary measures and rehabilitation measures for Earthquake disaster.	**Apply**
CO4	Derive the protection measures against floods, cyclone, land slides	**Apply**
CO5	Acquire knowledge about the effects of disasters on built structures	**Apply**
CO6	Acquire knowledge about the hazard Assessment procedure	**Apply**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	L	M	M	L
CO2	L	M	M	L
CO3	L	S	S	M
CO4	L	S	S	M
CO5	L	M	M	L
CO6	L	M	M	L

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Remember	20	20
Understand	20	20
Apply	60	60

Course Level Assessment Questions

Course Outcome 1 (CO1)

1. What is Richter Magnitude?
2. What is Peak ground Acceleration?
3. What is meant by *hazard mitigation*?
4. What is a Local Hazard Mitigation Plan?

Course Outcome 2 (CO2)

1. List the different types of droughts and highlight its various causes.
2. Define community Contingency Plan
3. How does the site soil affect the EQ response of structures?
4. Explain the classification and causes of landslides indicating the places where they could occur in India.

Course Outcome 3 (CO3)

1. Explain the plan, Mass and Geometric irregularities in the RC buildings. How these irregularities adversely affect the performance of the RC buildings during Earthquake
2. Discuss the various types of natural disasters and highlight the specific efforts to mitigate disasters in India

Course Outcome 4 (CO4)

1. Describe various types of hazards and impacts associated with earthquakes and highlight the lessons learnt

5. Briefly explain the components of follow-up activities in psychological rehabilitation of disaster affected people.

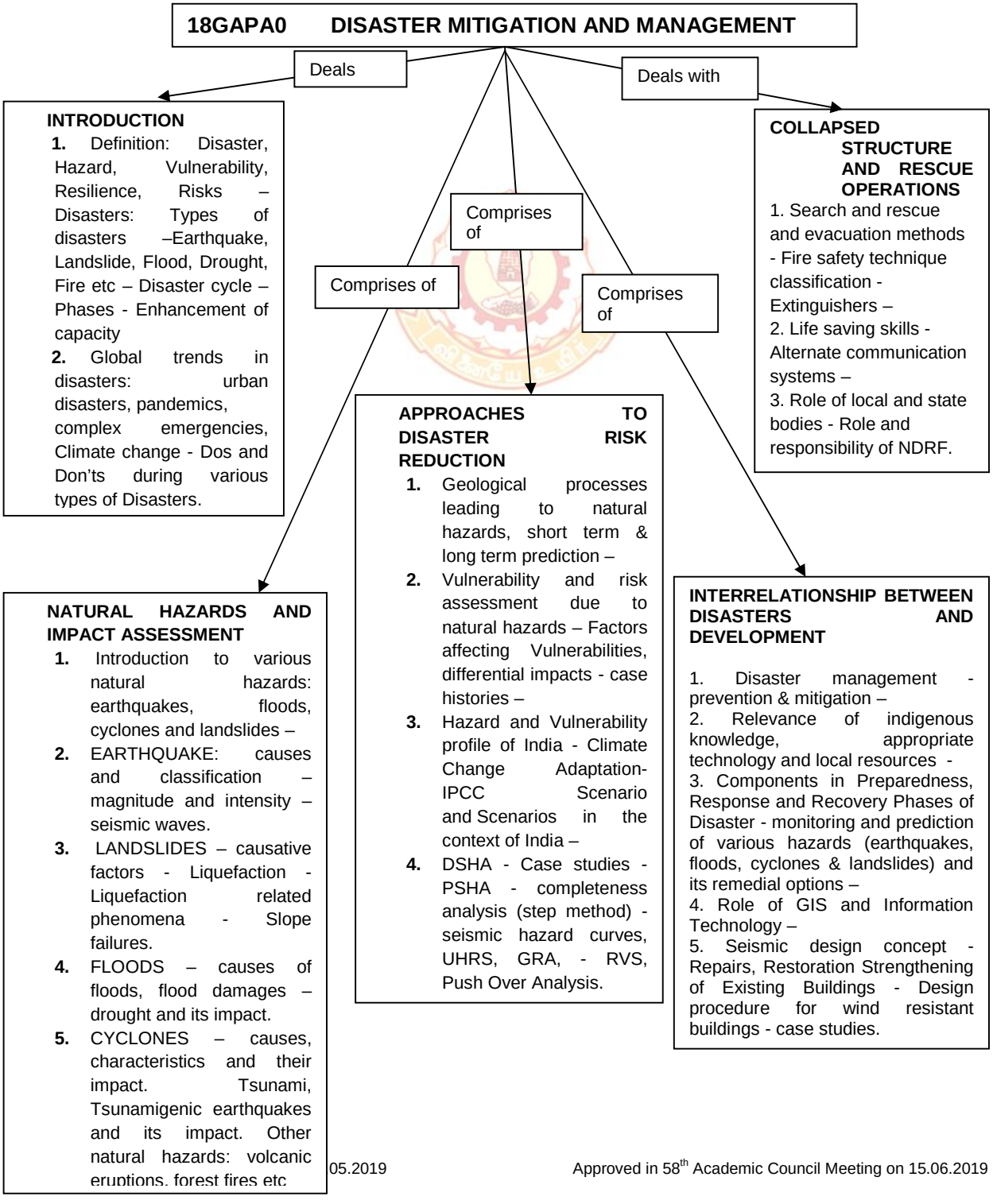
Course Outcome 5 (CO5)

1. If you were the relief commissioner of the state of Assam which is affected by floods every year list out five departments that you need to contact.
2. Identify four different task forces and list out two responsibilities of each of the task forces
3. Do you think disaster risk can be reduced through community participation? Discuss

Course Outcome (CO6)

1. Which areas are more prone to heat and cold waves in India? Discuss the preventive and preparedness measures that are mostly adopted for protection from heat and cold waves
2. Explain the role of central Government in responding to disasters
3. Describe suitable mitigation and preparedness measures that the community should take in advance to guard a EQ disaster occurring again.

Concept Map



Syllabus

INTRODUCTION TO DISASTERS - Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Disasters: Types of disasters –Earthquake, Landslide, Flood, Drought, Fire etc – Disaster cycle – Phases - Enhancement of capacity - Global trends in disasters: urban disasters, pandemics, complex emergencies, Climate change - Dos and Don'ts during various types of Disasters. **NATURAL HAZARDS AND IMPACT ASSESSMENT -** Introduction to various natural hazards: earthquakes, floods, cyclones and landslides – EARTHQUAKE: causes and classification – magnitude and intensity – seismic waves. LANDSLIDES – causative factors - Liquefaction - Liquefaction related phenomena - Slope failures. FLOODS – causes of floods, flood damages – drought and its impact. CYCLONES – causes, characteristics and their impact. Tsunami, Tsunamigenic earthquakes and its impact. Other natural hazards: volcanic eruptions, forest fires etc. **APPROACHES TO DISASTER RISK REDUCTION (DRR) & HAZARD ASSESSMENT PROCEDURE -** Geological processes leading to natural hazards, short term & long term prediction - Vulnerability and risk assessment due to natural hazards – Factors affecting Vulnerabilities, differential impacts - case histories - Hazard and Vulnerability profile of India - Climate Change Adaptation- IPCC Scenario and Scenarios in the context of India - DSHA - Case studies - PSHA - completeness analysis (step method) - seismic hazard curves, UHRS, GRA, - RVS, Push Over Analysis. **INTER-RELATIONSHIP BETWEEN DISASTERS AND DEVELOPMENT -** Disaster management - prevention & mitigation - Relevance of indigenous knowledge, appropriate technology and local resources - Components in Preparedness, Response and Recovery Phases of Disaster - monitoring and prediction of various hazards (earthquakes, floods, cyclones & landslides) and its remedial options - Role of GIS and Information Technology - Seismic design concept - Repairs, Restoration Strengthening of Existing Buildings - Design procedure for wind resistant buildings - case studies. **CSSR -COLLAPSED STRUCTURE & RESCUE OPERATIONS -** Search and rescue and evacuation methods - Fire safety technique classification - Extinguishers - Life saving skills - Alternate communication systems - Role of local and state bodies - Role and responsibility of NDRF.

References

1. C.Emdad Haque, Mitigation of natural hazards and disasters, Klwuer Academic publishers group, 2005.
2. General Blokdijk, Disaster recovery planning and services, Gennaio publishers, 2008.
3. Linda C.Bottersil and Ponald A.Wilhite, from disaster response to risk management, Klwuer Academic Publishers Group, 2005.
4. Mohamed Gad Large Scale disasters: prediction, control and mitigation, Cambridge University press, 2008.
5. Sisi zlatanova and AndreaFabbri Jonatahnli, Geometrics solutions for disaster management, Springer Verlag, 2007.
6. Mitigating Natural Disasters, Phenomena, Effects and options, A Manual for policy makers and planners, United Nations, New York, 1991.
7. George G.Penelis and Andrea's J.Kappos – Earth quake resistant concrete structures. E& FN SPAN, London 1997.

Course Contents and Lecture Schedule

S.No.	Topic	No. of lectures
1	**INTRODUCTION TO DISASTERS**	**4**
1.1	Definition: Disaster, Hazard, Vulnerability, Resilience, Risks	2
1.2	Disasters: Types of disasters –Earthquake, Landslide, Flood, Drought, Fire	

	etc	
1.3	Disaster cycle – Phases - Enhancement of capacity	1
1.4	Global trends in disasters: urban disasters, pandemics, complex emergencies	1
1.5	Climate change - Dos and Don'ts during various types of Disasters.	
2	**NATURAL HAZARDS AND IMPACT ASSESSMENT**	**8**
2.1	Introduction to various natural hazards: earthquakes, floods, cyclones and landslides	1
2.2	EARTHQUAKE: causes and classification – magnitude and intensity – seismic waves.	2
2.3	LANDSLIDES – causative factors - Liquefaction - Liquefaction related phenomena - Slope failures.	2
2.4	FLOODS – causes of floods, flood damages – drought and its impact.	1
2.5	CYCLONES – causes, characteristics and their impact.	1
2.6	Tsunami, Tsunamigenic earthquakes and its impact. Other natural hazards: volcanic eruptions, forest fires etc.	1
3	**APPROACHES TO DISASTER RISK REDUCTION (DRR) & HAZARD ASSESSMENT PROCEDURE**	**13**
3.1	Geological processes leading to natural hazards, short term & long term prediction	1
3.2	Vulnerability and risk assessment due to natural hazards – Factors affecting Vulnerabilities, differential impacts - case histories	3
3.3	Hazard and Vulnerability profile of India - Climate Change Adaptation- IPCC Scenario and Scenarios in the context of India	3
3.4	DSHA - Case studies - PSHA - completeness analysis (step method) - seismic hazard curves, UHRS, GRA, - RVS, Push Over Analysis.	3
4	**INTER-RELATIONSHIP BETWEEN DISASTERS AND DEVELOPMENT**	**10**
4.1	Disaster management - prevention & mitigation	1
4.2	Relevance of indigenous knowledge, appropriate technology and local resources -	2
4.3	Components in Preparedness, Response and Recovery Phases of Disaster - monitoring and prediction of various hazards (earthquakes, floods, cyclones & landslides) and its remedial options -	3
4.4	Role of GIS and Information Technology -	2
4.5	Seismic design concept - Repairs, Restoration Strengthening of Existing Buildings - Design procedure for wind resistant buildings - case studies.	2
5	**CSSR -COLLAPSED STRUCTURE & RESCUE OPERATIONS -**	**10**
5.1	Search and rescue and evacuation methods - Fire safety technique classification - Extinguishers	3
5.2	Life saving skills - Alternate communication systems	2
5.3	Role of local and state bodies - Role and responsibility of NDRF and other bodies.	4

TOTAL NO OF HOURS **45**

Course Designers:

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18GAPB0 **DIGITAL TOOLS FOR ENVIRONMENTAL ARCHITECTURE**

Category	L	T	P	C
PE	3	0	0	3

Preamble

To provide exposure to environmental performances & analysis tool based on climatic data models and data structure.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able

CO1	Understand various climatic factors and their influence in building design	**Understand**
CO2	Analyse appropriate design elements, strategies, form for achieving thermal comfort in Buildings	**Apply and Analyse**
CO3	Gain knowledge on various analysis tool based on climatic data models and data structure.	**Apply**
CO4	Evaluate the Environmental Performance of Buildings through various simulation software	**Evaluate**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PEO1	PEO2	PEO3
CO1	M	M	M	M	S	M	M
CO2	M	M	L	L	S	M	M
CO3	S	S	S	S	S	M	S
CO4	S	S	S	S	S	M	S

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Understand	20	20
Analyse	20	20
Apply	30	30
Evaluate	30	30

Course Level Assessment Questions

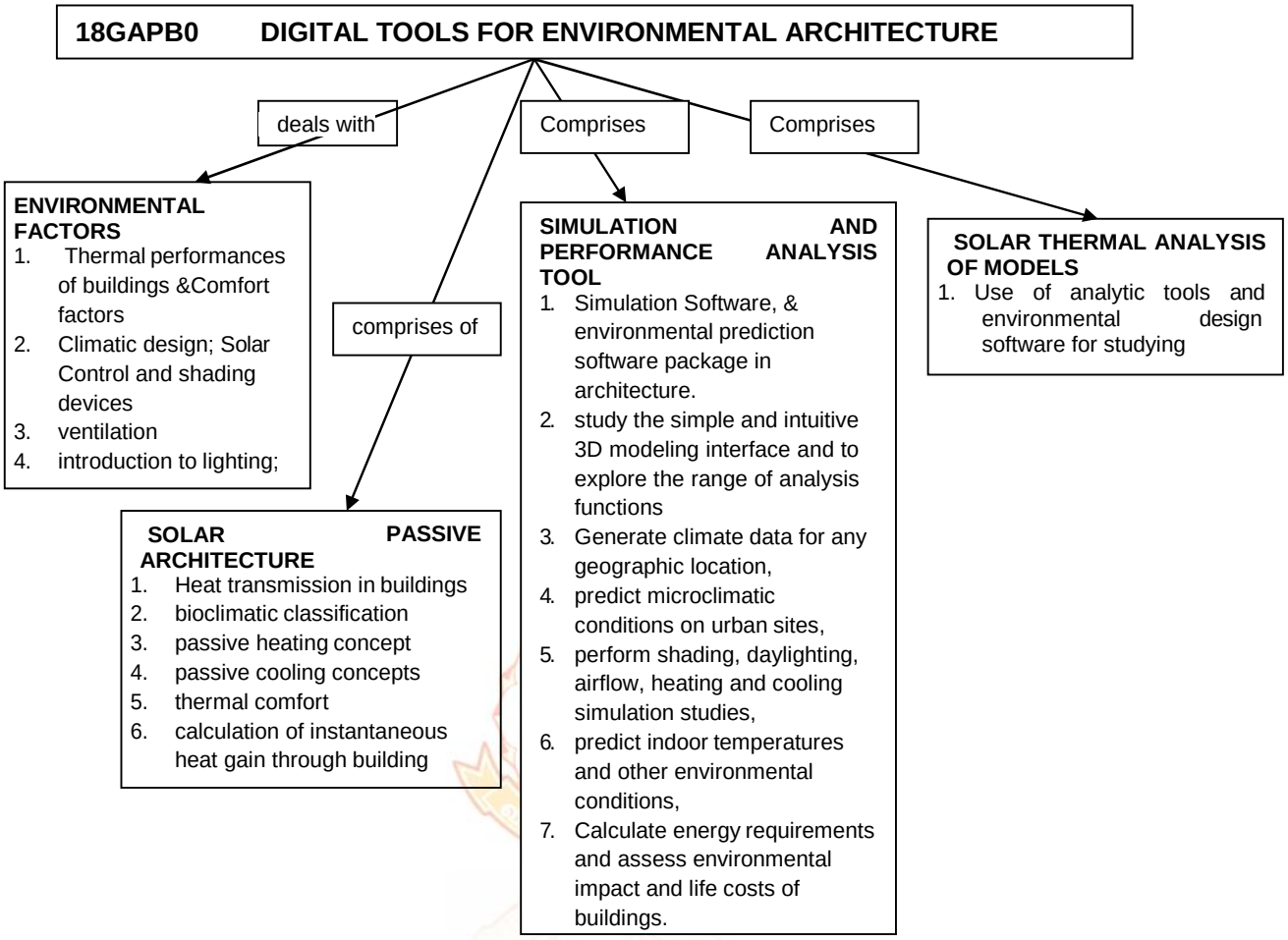
Course Outcome 1 (CO1):
1. List out the Climatic factors and Illustrate the role of any two factors with examples.
2. List down the advantages of Day lighting Techniques.

Course Outcome 2 (CO2)
1. Explain Stack effect in buildings.
2. Explain how you could integrate vegetation and water bodies in design as a measure to control thermal comfort in buildings.

Course Outcome 3 (CO3):
1. How will you generate analyse Climatic data for any given geographic location?
2. Discuss in detail, the Role of Energy management systems in buildings.

Course Outcome 4 (CO4):
1. How will you perform Energy analysis in a simulation software.
2. Discuss in detail, how the application of simulation software will be helpful in designing environmentally friendly and Energy efficient Buildings.

Concept Map



Syllabus

ENVIRONMENTAL FACTORS Thermal performances of buildings; Comfort factors and measurements; Climatic design; Solar Control and shading devices, Louvre design; ventilation; introduction to lighting; units of light, colour, lamps, luminaries, Daylight design of general lighting schemes; Energy management and lighting . **SOLAR PASSIVE ARCHITECTURE** Heat transmission in buildings - bioclimatic classification - passive heating concept: direct heat gain - indirect heat gain - isolated gain and sunspaces-passive cooling concepts: evaporative cooling – radiative cooling - thermal comfort- concept of solar temperature and its significance -calculation of instantaneous heat gain through building envelope. **SIMULATION AND PERFORMANCE ANALYSIS TOOL** Introduction to Simulation Software, an environmental prediction software package in architecture. to study the simple and intuitive 3D modeling interface and to explore the range of analysis functions Generate and analyse climate data for any geographic location, predict microclimatic conditions on urban sites, perform shading, daylighting, airflow, heating and cooling simulation studies, predict indoor temperatures and other environmental conditions, calculate energy requirements and assess environmental impact and life costs of buildings. **SOLAR THERMAL ANALYSIS OF MODELS** Use of analytic tools and environmental design software for studying solar, thermal and lighting processes in and around real or virtual buildings

References

1. Garg H P., Prakesh J., Solar Energy: Fundamentals & Applications, Tata McGraw Hill, 2000.
2. Duffie, J.A. and Beckman, W.A., Solar Engineering of Thermal Processes, John Wiley, 1991.

3. Alan L Fahrenbruch and Richard H Bube, Fundamentals of Solar Cells: PV Solar Energy Conversion, Academic Press, 1983
4. Autodesk Ecotect Analysis 2010 Bible.

Course Contents and Lecture Schedule

S.No	Topic	No. of lectures
1	**ENVIRONMENTAL FACTORS**	**8**
1.1	Thermal performances of buildings; Comfort factors and measurements; Climatic design;	
1.2	Solar Control and shading devices, Louvre design; ventilation;	
1.3	introduction to lighting; units of light, colour, lamps, luminaries, Daylight design of general lighting schemes; Energy management and lighting	
2	**SOLAR PASSIVE ARCHITECTURE**.	**8**
2.1	Heat transmission in buildings - bioclimatic classification - passive heating concept: direct heat gain - indirect heat gain - isolated gain and sunspaces-	
2.2	passive cooling concepts: evaporative cooling – radiative cooling - thermal comfort- concept of solar temperature and its significance -	
2.3	calculation of instantaneous heat gain through building envelope	
3	**SIMULATION AND PERFORMANCE ANALYSIS TOOL**	**20**
3.1	Introduction to Simulation Software, an environmental prediction software package in architecture. to study the simple and intuitive 3D modeling interface	
3.2	explore the range of analysis functions Generate and analyse climate data for any geographic location, predict microclimatic conditions on urban sites, perform shading, daylighting, airflow, heating and cooling simulation studies, predict indoor temperatures and other environmental conditions,	
3.3	calculate energy requirements and assess environmental impact and life costs of buildings.	
4	**SOLAR THERMAL ANALYSIS OF MODELS**	**10**
4.1	Use of analytic tools and environmental design software for studying solar, thermal and lighting processes in and around real or virtual buildings	4
TOTAL NO OF HOURS		**45**

Course Designers:

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2. Dr.A.Madhumathi - madhu@tce.edu

18GAPD0	ARCHITECTURE AND CRITICAL THEORY	Category	L	T	P	C
		PE	3	0	0	3

Preamble

The approach of the course will be to address current day problems, projecting back into the past in order to offer something of a historical "frame" to understand the present.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able

CO1	Understanding of architecture as an integral production of society.	**Understand**
CO2	Reasoning out principles and ideologies according to time, space and context.	**Analyse**
CO3	Appraise architecture valuing the importance of historical, theoretical and contextual realms.	**Apply**
CO4	Develop the skill to identify, decipher and interpret issues relating to architecture based on. Architectural criticism.	**Analyse**
CO5	Distinguishing visual languages in architecture, isolating specific vocabulary for justifying the design context	**Evaluate**
CO6	The students' awareness through this course would inform their future practice/ research/teaching.	**Analyse**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	**L**	**S**	**L**	**M**
CO2	**L**	**S**	**S**	**M**
CO3	**S**	**S**	**M**	**S**
CO4	**S**	**S**	**M**	**S**
CO5	**L**	**L**	**L**	**M**
CO6	**M**	**M**	**M**	**M**

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Understand	**20**	**20**
Apply	**20**	**20**
Analyse	**40**	**40**
Evaluate	**20**	**20**

Course Level Assessment Questions

Course Outcome 1 (CO1):
1. Elucidate the impact of design on people and, simultaneously, on how architects negotiate with clients, users, and builders to get things done
2. Critically re-imagine design as social instruments/ symbols and architects as providers of varied values.

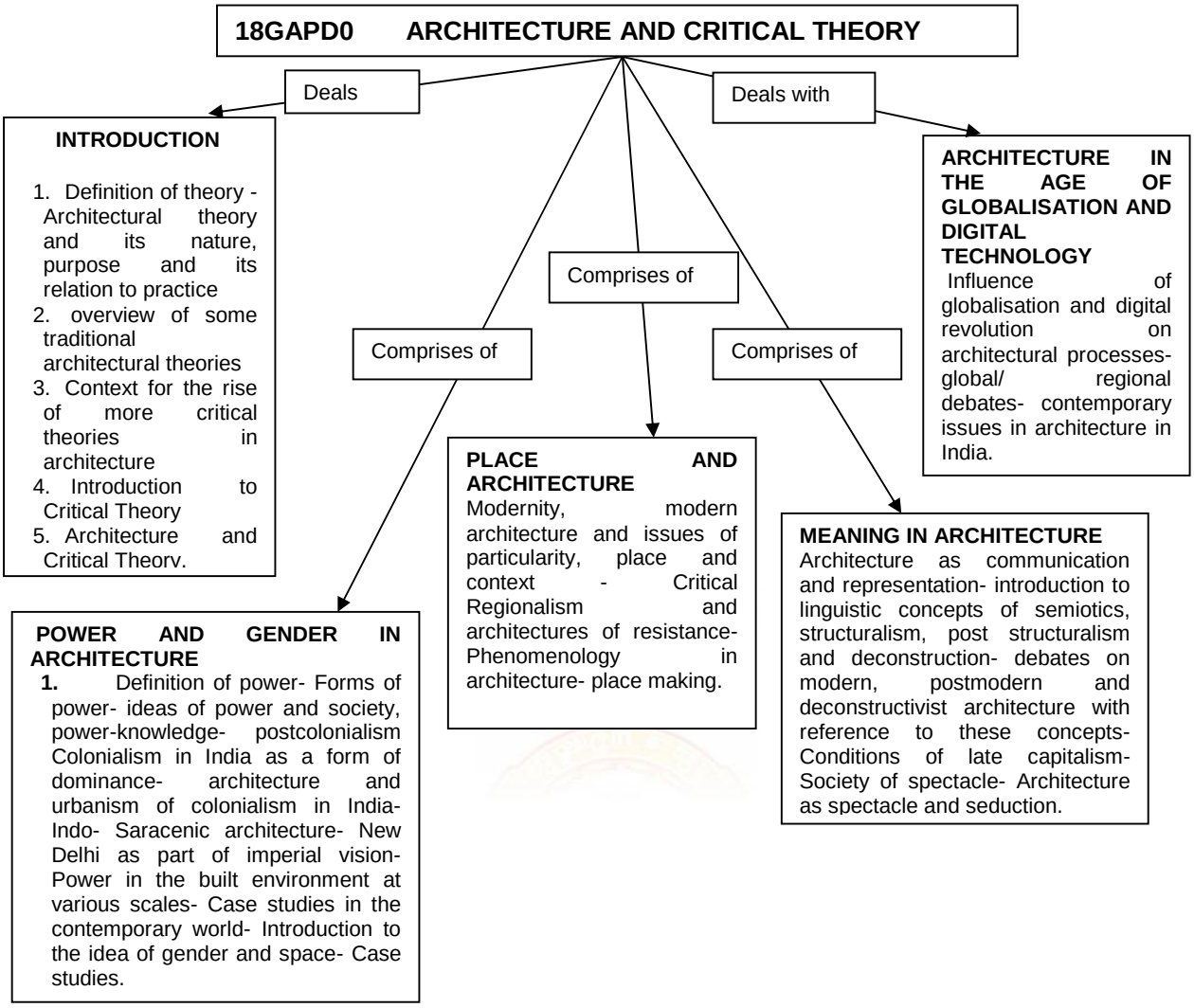
Course Outcome 2 (CO2):
1. Represent power in architecture in various contexts.

Course Outcome 3 (CO3):
1. Evolution of phenomenology based on momentary concepts of renowned architects.

Course Outcome 4 (CO4):
1. Weigh on the impacts of globalization on architecture.

Course Outcome 5 (CO5):
1. Speculate 'Architecture as a spectacle and seduction.'
Course Outcome 6 (CO6):
1. Elucidate the nuances of Self approval vs. Client satisfaction in Architectural design.

Concept Map



Syllabus

INTRODUCTION - Definition of theory - Architectural theory and its nature, purpose and its relation to practice - overview of some traditional architectural theories- context for the rise of more critical theories in architecture – Introduction to Critical Theory- Architecture and Critical Theory. **POWER AND GENDER IN ARCHITECTURE -** Definition of power- Forms of power- ideas of power and society, power-knowledge- post colonialism- Colonialism in India as a form of dominance- architecture and urbanism of colonialism in India- Indo- Saracenic architecture- New Delhi as part of imperial vision- Power in the built environment at various scales- Case studies in the contemporary world- Introduction to the idea of gender and space- Case studies. **PLACE AND ARCHITECTURE -** Modernity, modern architecture and issues of particularity, place and context - Critical Regionalism and architectures of resistance- Phenomenology in architecture- place making. **MEANING IN ARCHITECTURE** Architecture as communication and representation- introduction to linguistic concepts of semiotics, structuralism, post structuralism and deconstruction- debates on modern, postmodern and deconstructivist architecture with reference to these concepts- Conditions of late capitalism- Society of spectacle- Architecture as spectacle and seduction. **ARCHITECTURE IN THE AGE OF GLOBALISATION AND DIGITAL**

TECHNOLOGY - Influence of globalisation and digital revolution on architectural processes- global/ regional debates- contemporary issues in architecture in India.

References

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6. Christian Norberg Schulz- Towards a Phenomenology of Architecture, Rizzoli New York, 1980
7. Harry Francis Mallgrave and David Goodman, An Introduction to Architectural Theory- 1968 to the present, Wiley Blackwell 2011
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Course Contents and Lecture Schedule

S.No	Topic	No. of lectures
1	**INTRODUCTION**	**6**
1.1	Definition of theory - Architectural theory and its nature, purpose and its relation to practice	2
1.2	Overview of some traditional architectural theories- context for the rise of more critical theories in architecture	2
1.3	Introduction to Critical Theory- Architecture and Critical Theory.	2
2	**POWER AND GENDER IN ARCHITECTURE**	**9**
2.1	Definition of power- Forms of power- ideas of power and society, power-knowledge-	2
2.2	Post colonialism- Colonialism in India as a form of dominance- architecture and urbanism of colonialism in India-	2
2.3	Indo- Saracenic architecture- New Delhi as part of imperial vision	2
2.4	Power in the built environment at various scales- Case studies in the contemporary world	2
2.5	Introduction to the idea of gender and space- Case studies.	1
3	**PLACE AND ARCHITECTURE**	**10**
3.1	Modernity, modern architecture and issues of particularity, place and context -	5
3.2	Critical Regionalism and architectures of resistance- Phenomenology in architecture- place making.	5
4	**MEANING IN ARCHITECTURE**	**10**
4.1	Architecture as communication and representation- introduction to linguistic concepts of semiotics, structuralism, post structuralism and deconstruction	4
4.2	debates on modern, postmodern and deconstructivist architecture with reference to these concepts	4
4.3	Conditions of late capitalism- Society of spectacle- Architecture as spectacle and seduction	2
5	**ARCHITECTURE IN THE AGE OF GLOBALISATION AND DIGITAL TECHNOLOGY**	**10**
5.1	Influence of globalisation and digital revolution on architectural processes	5
5.2	Global/ regional debates- contemporary issues in architecture in India.	5
TOTAL NO OF HOURS		**45**

Course Designers:

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18GAPE0 PROJECT MANAGEMENT

Category	L	T	P	C
PE	3	0	0	3

Preamble

Complex research and development projects can be managed effectively if the project managers have the means to plan and control the schedules and costs of the work required to achieve their technical performance objectives. When planning of a project is undertaken aspects such as resources needed for its accomplishment, its cost, its duration should be determined. The answers to all these questions can be found by adopting the modern techniques of project management.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Explain the concept of projects, its process, objectives and functions of project management	**Understand**
CO2	Analyze and Manage time in projects through Gantt charts, CPM and PERT techniques	**Apply**
CO3	Balance resource requirements of projects so as to avoid idling of resources	**Apply**
CO4	Update projects and determine revised schedule of activities and critical path if any	**Apply**
CO5	Crash projects to determine its optimum time- minimum cost Relationships	**Apply**
CO6	To analyze 'life cycle costs' of Projects	**Apply**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	**L**	**L**	**M**	**L**
CO2	**L**	**L**	**M**	**L**
CO3	**L**	**M**	**S**	**L**
CO4	**M**	**M**	**S**	**L**
CO5	**S**	**L**	**M**	**L**
CO6	**S**	**M**	**M**	**L**

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Understand	**0**	**0**
Apply	**40**	**40**
Analyse	**60**	**60**

Course Level Assessment Questions

Course Outcome 1(CO1):

1. Discuss the functions of project management
2. Discuss the essential conditions to be satisfied for sanction of projects
3. Explain the meaning and significance of Statement of Work in relation to projects

Course Outcome 2 (CO2):

1. A project consists of 12 activities. The time required for each activity is given in the table below. Use the following logical relationships and draw a network diagram for the project and determine the critical path and duration required for completion of the project.

- Activity A,D and H can be performed concurrently and represent the start of the project
- B succeeds A; C and G follow H; D,C and B precede F; L follows A
- M comes after G; K is preceded by L; X cannot start until K, F and M are completed
- Z succeeds G; X and Z are last operations

2. Discuss the merits and limitations of bar-chart technique

3. A project consists of 5 activities with the following relationship. Draw a bar chart assuming that the project commences on 15th April, Wednesday with five working days a week. Determine the project completion day and date. What is the total duration of the project?

A is the initial activity with duration of 7 days for completion
A is followed by B and D with duration of 2 days and 5 days respectively
E can start after half the work of B is over and it takes 9 days for completion
D and B precede F which takes 5 days for completion

Course Outcome 3 (CO3):

1. List the resources for a project

Course Outcome 4 (CO4)

1. A project consists of 5 activities with the following relationship. Draw a bar chart.

Determine the project completion day and date. What is the total duration of the project?
A is the initial activity with duration 7 days for completion
A is followed by B and D with duration of 5 days and 4 days respectively
E can start after half the work of B is over and it takes 9 days for completion
D and B precede F which takes 5 days for completion

If on the 11th day of commencement the following status occurs, update the project and determine the revised completion time if any?
A is completed as per schedule
B is in progress and requires 2 more days for completion
D is delayed by 7 days and it requires 8 more days for its completion
E is in progress and the original time will hold good; F is yet to start

2. Define updating of projects mentioning its significance.

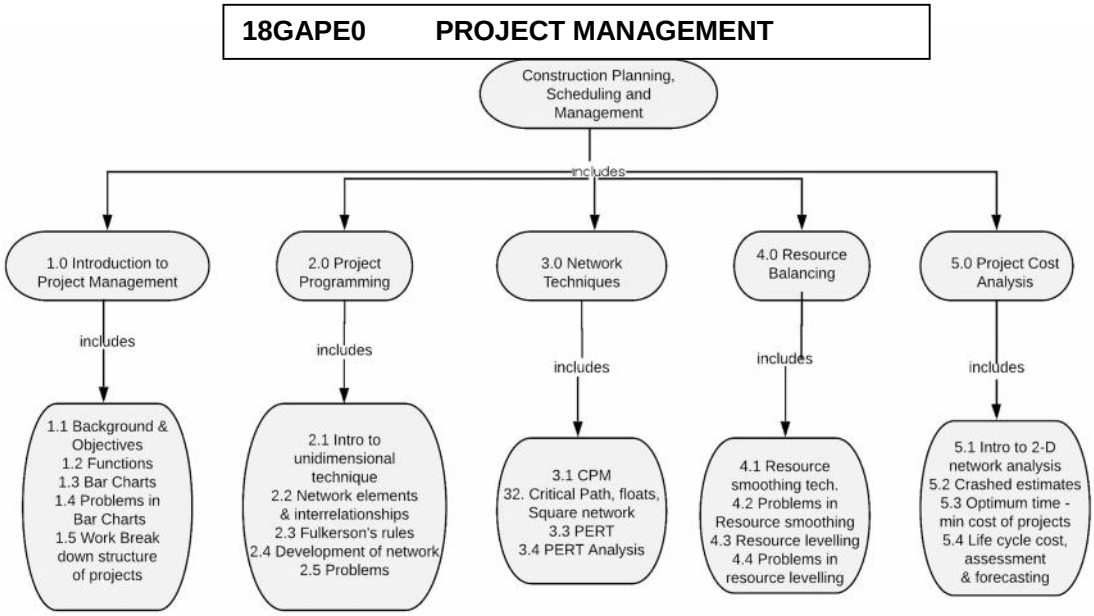
Course Outcome 5(CO5):

1. List the benefits and limitations of latest tools in project management

Course Outcome 6(CO6):

1. Compare the behaviour of direct and indirect cost of a project with respect to time and draw its relationship. If there is a loss encountered in a project during its execution, what would be it's impact on the total cost of the project?

Concept Map



Syllabus

Project and its process- Define project and process, boundaries of project, Objectives and functions of Project management, characteristics and types of projects, organization structure / styles, roles of project management group, project management office and its role, project knowledge area, project integration- process group interaction. Project flow, project life cycle - influencing factors - Case study **Project Time Management:** Project Scope Management - Work break down structure- Activity/ Task- Events- Case study. Project planning tools- Rolling wave planning. Gantt Charts, Milestone chart, Program Progress chart- Creating milestone plan. Project Network- Fulkerson's rules – A-O-A and A-O-N networks. Analyze project time- Critical path method (deterministic approach- activity oriented network analysis- 80-20 rule- Case study, type of time estimates & Square network diagram. Project updating and monitoring- Case study. Estimate time- Program Evaluation & Review Technique (Probabilistic Approach)- Event oriented network analysis- Optimistic, Pessimistic and Most likely time, Degree of variability in average time, Probabilistic estimate, % utilization of resources. **Resource Management:** Types of resource- Time, Men, Material, Machinery, Money, Space. Balancing of resource- Resource Smoothing technique- Time constraint. Resource leveling technique- Resource constraint- Case study. **Resource optimization:** Types of cost – Direct, Indirect and Total Cost. Variation of Cost with time. Schedule Compression Techniques- Crashing, Fast Tracking & Re-estimation- Crash time and crash cost. Optimize project cost for time and resource. CPM Cost model. Life cycle assessment- impacts and economical assessment, Life cycle cost- maintenance and operation, life cycle forecasting – concept and applications. **Emerging trends in project management:** Agile Project management and Project Management using latest tools- Case study.

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2. A Risk Management Standard, AIRMIC Publishers, ALARM, IRM: 2002
3. Gene Dixon, "Service Learning and Integrated Collaborative Project Management", Project Management Journal, DOI:10.1002/pmi, February 2011, pp.42-58
4. Jerome D. Wiest and Ferdinand K. Levy, "A Management Guide to PERT/CPM", Prentice Hall of India Publishers Ltd., New Delhi, 1994.
5. Punmia B. C. and Khandelwal K.K., "Project Planning and Control with PERT/CPM", Laxmi publications, New Delhi, 1989.
6. Srinath L.S., "PERT & CPM- Principles and Applications", Affiliated East West Press Pvt., Ltd., New Delhi, 2008
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8. SangaReddi. S and Meiyappan. PL, "Construction Management", Kumaran Publications, Coimbatore, 1999

Course Contents and Lecture Schedule

S.No.	Topic	No. of lectures
1.0	**Introduction to Project Management**	**10**
1.1	Define project and process, boundaries of project Introduction to project management concept, background of management, purpose, objectives, Characteristics of projects, Organization structure / styles of project and Functions of management	2
1.2	Roles of project management group, project management office and its role, Project knowledge area, project integration- process group interaction, Project flow, project life cycle- influencing factors, Case study	2
1.3	Traditional management systems – Gantt approach, progresschart, Bar-chart- Merits and limitations	2
1.4	Problems in Bar-chart	2
1.5	Work study, work break down structure, time estimate	2
2.0	**Project Programming**	**10**
2.1	Introduction to modern management concepts, uni-dimensional, management techniques	2

2.2	Introduction to network concepts, network elements and interrelationships	2
2.3	Network techniques, network logic- inter- relationships activity information, data sheets	2
2.4	Development of network based on Fulkerson's rules	2
2.5	Problems in development of network	2
3.0	**Network Techniques**	**8**
3.1	Critical Path Method (CPM) for management, CPM network analysis	2
3.2	Identification of critical path, floats, square network diagrams-problems	2
3.3	Programme Evaluation and Review Technique (PERT) network-introduction to theory of probability and statistics, probabilistic time estimation for activities	2
3.4	Analysis of PERT network – problems, Delta Charts – concept and applications	2
4.0	**Resource Balancing**	**8**
4.1	Resource balancing- objectives, resource smoothing technique – concept and procedure	2
4.2	Problems using resource smoothing technique	2
4.3	Resource Levelling technique - concept and procedure	2
4.4	Problems using Resource Levelling technique	2
5.0	**Project Cost**	**9**
5.1	Introduction to two-dimensional network analysis – activity cost information, cost –time relationship	2
5.2	Crashed estimates for the activities, compression potential, cost slope, utility data sheet, project direct and indirect cost	2
5.3	Crashed programmes, network compression, least cost solution, least time solution and optimum time solution-Problems	2
5.4	Life cycle assessment- impacts and economical assessment, Life cycle cost- maintenance and operation, life cycle forecasting – concept and applications, Time value of money. Emerging trends in project management: Project Management using latest tools- Case study	3

TOTAL NO OF HOURS **45**

Course Designers:

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18GAPF0 INTELLECTUAL PROPERTY RIGHTS

Category	L	T	P	C
PE	3	0	0	3

Preamble

This course is designed to introduce the importance of Intellectual Property rights and Copyrights and to get awareness of acquiring the patent and copyright for their innovative works. The course also aids the students to register their innovations and protect innovation in the form of intellectual property rights.

Prerequisite

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1 Acquire knowledge about the concept of intellectual Property rights, patents, copy right, trademarks and Value the importance of getting patents and copyrights for the innovations **Understand**

CO2 Analyse the procedure for applying and receiving the registration in national and international level. **Analyse**

CO3 Analyse the process of evolution of Architectural patents and copyrights as a solution with novelty. **Analyse**

CO4 Analyse the parameters to be considered for the integration of novelty for identified issues in the field of design, construction and management through the case examples. **Analyse**

CO5 Apply novelty in their designs to get them patented and copyrighted. **Apply**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	M	L	L	L
CO2	M	M	M	M
CO3	S	M	M	M
CO4	S	S	M	M
CO5	S	S	S	S

S-Strong; M-Medium; L-Low

Assessment Pattern

Bloom's Taxonomy	Continuous Assessment Tests	Terminal Examination
Understand	20	20
Apply	20	20
Analyse	60	60

Course Level Assessment Questions

COURSE OUTCOME 1 (CO1)

1. List out the objectives of intellectual property rights.
2. Write short notes on Geographical Indication.
3. Discuss the responsibility of WTO in safeguarding IPR internationally.
4. Distinguish between international trade mark law and copy right law.

COURSE OUTCOME 2 (CO2)

1. Write the procedure for Trademark registration.
2. Sequence the procedure to apply for design registration in foreign countries.

COURSE OUTCOME 3 (CO3)

1. Investigate on what is protected as part of Copyright of a building under the Copyrights Act of 1957.
2. Analyse the evolution of Architectural Patents and copyrights in the aspect of integration of novelty in the solution for an issue.

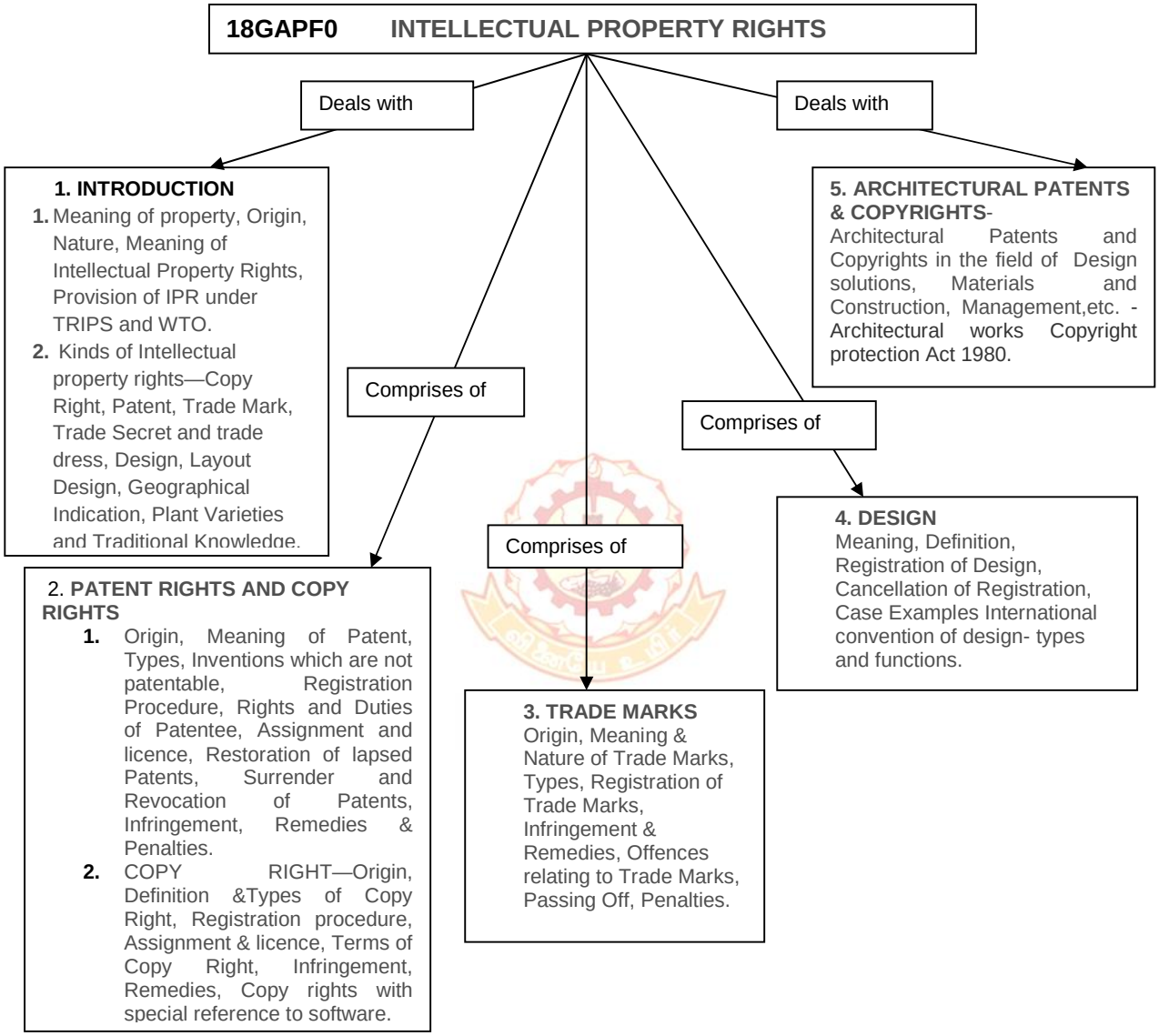
COURSE OUTCOME 4 (CO4)

1. Create a list of parameters on which patents or copyrights can be availed in the field of Architecture.
2. Write the procedure for cancellation of registration of a design.

COURSE OUTCOME 5 (CO5)

1. Explain the integration of novelty in the field of construction materials and techniques with an example.
2. Explain the role of Biomimic concepts in the novelty integration of Architectural patents.

Concept Map



Syllabus

INTRODUCTION- Meaning of property, Origin, Nature, Meaning of Intellectual Property Rights, Provision of IPR under TRIPS and WTO. Kinds of Intellectual property rights—Copy Right, Patent, Trade Mark, Trade Secret and trade dress, Design, Layout Design, Geographical Indication, Plant Varieties and Traditional Knowledge. **PATENT RIGHTS AND COPY RIGHTS-** Origin, Meaning of Patent, Types, Inventions which are not patentable, Registration Procedure, Rights and Duties of Patentee, Assignment and licence, Restoration of lapsed Patents, Surrender and Revocation of Patents, Infringement, Remedies & Penalties- **COPY RIGHT**—Origin, Definition &Types of Copy Right, Registration procedure, Assignment & licence, Terms of Copy Right, Infringement, Remedies, Copy rights with special reference to software. **TRADE MARKS- Origin**, Meaning & Nature of Trade Marks, Types, Registration of Trade Marks, Infringement & Remedies, Offences relating to Trade Marks, Passing Off, Penalties. **DESIGN-** Meaning, Definition, Registration of Design, Cancellation of Registration, Case Examples, International convention of design- types and functions- **ARCHITECTURAL PATENTS & COPYRIGHTS**- Architectural Patents and

Copyrights in the field of Design solutions, Materials and Construction, Management, etc. - Architectural works Copyright protection Act 1980.

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Course Contents and Lecture Schedule

S.No.	Topic	No. of lectures
1	**INTRODUCTION**	**8**
1.1	Meaning of property, Origin, Nature, Meaning of Intellectual Property Rights. Provision of IPR under TRIPS and WTO.	4
1.2	Kinds of Intellectual property rights—Copy Right, Patent, Trade Mark, Trade Secret and trade dress, Design, Layout Design, Geographical Indication, Plant Varieties and Traditional Knowledge.	4
2	**PATENT RIGHTS AND COPY RIGHTS**	**12**
2.1	PATENT- Origin, Meaning of Patent, Types, Inventions which are not patentable.	2
2.2	Registration Procedure, Rights and Duties of Patentee, Assignment and licence.	2
2.3	Restoration of lapsed Patents, Surrender and Revocation of Patents, Infringement, Remedies & Penalties.	2
2.4	COPY RIGHT—Origin, Definition &Types of Copy Right.	2
2.5	Registration procedure, Assignment & licence, Terms of Copy Right.	2
2.6	Infringement, Remedies, Copy rights with special reference to software.	2
3	**TRADE MARKS**	**10**
3.1	Origin, Meaning & Nature of Trade Marks, Types of Trademarks.	4
3.2	Registration of Trade Marks, Infringement & Remedies.	3
3.3	Offences relating to Trade Marks, Passing Off, Penalties.	3
4	**DESIGN**	**6**
4.1	Meaning, Definition, Registration of Design,	2
4.2	Cancellation of Registration, Case Examples	2
4.3	International convention of design- types and functions.	2
5	**ARCHITECTURAL PATENTS & COPYRIGHTS**	**9**
5.1	Architectural Patents and Copyrights in the field of Design solutions, Materials and Construction, Management, etc.	6
5.3	Architectural works Copyright protection Act 1980.	3
	TOTAL NO OF HOURS	**45**

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