MAHATMA GANDHI UNIVERSITY, KERALA

Abstract

Master of Architecture (Advanced Architecture) Programme - Modified Scheme and Syllabus - 2024 admission onwards - Approval - Recommendations of the Board of Studies in Architecture (UG & PG Combined) - Resolution of Academic Council - Modified U.O issued.

ACADEMIC A 4 SECTION

No. 3371/AC A 4/2025/MGU Priyadarsini Hills,Dated: 09.04.2025

Read:-1.Item No. 137/60811/Ac A4/1/M.Arch New Syllabus approval/ASADI/2023 of the Minutes of the meeting of the Academic Council held on 25.02.2025.
2. U.O No. 3055/AC A2/2025/MGU, Dated 30.03.2025

ORDER

The scheme and syllabus of all the semesters of Master of Architecture (Advanced Architecture) Programme, submitted by Asian School of Architecture and Design Innovations were approved by the Academic Council held on 30.09.2024 and accordingly the U.O.No. 10019/ACA4/2024/MGU, Dtd - 05.11.2024 was issued. In addition to this, a newly proposed set of regulations and changes in the Scheme and Syllabus of Master of Architecture (Advanced Architecture) Programme were submitted by Asian School of Architecture and Design Innovations for approval. And these Scheme & Syllabus were submitted before the Board of Studies in Architecture (UG &PG) for the opinion. By examining the Scheme & Syllabus of Master of Architecture (Advanced Architecture) the Board of Studies in Architecture has recommended to approve the modified Scheme & Syllabus of Master of Architecture (Advanced Architecture).

Above recommendations of the Board of Studies were placed before the Academic Council and its meeting held on 25.02.2025 vide the Paper read above, has resolved to approve the recommendations of Board of Studies in Architecture and to approve the modified Scheme & Syllabus of Master of Architecture (Advanced Architecture). Accordingly the U.O.No. 3055/ACA4/2025/MGU, Dtd- 30.03.2025 was issued. However, the Course code for the subject Professional Training/Exchange Programme in the fourth semester was incorrectly shown as 24 AA 4001 in the Annexure of the U.O read as (2) above due to clerical error , whereas the correct Course code is 24AA40001.

The University Order read as (2) above stands modified to this extent.

Orders are issued accordingly.

SREEJITH R

ASSISTANT REGISTRAR I
(ACADEMIC)
For REGISTRAR

Copy To

1.PS to VC/PVC
2.PA to Registrar/Controller of Examinations
3. AR/DR/JR(Exam/Academic)
4.EI 15 /ACC1/ACC2 sections
5.PRO Section
6.Records/Stock File

Encl

MArch (Advanced Architecture) Scheme & Syllabus - 2024 admission onwards - Modified

Forwarded / By Order

Section Officer

MAHATMA GANDHI UNIVERSITY
KOTTAYAM

REGULATIONS FOR MASTER OF ARCHITECTURE

(FULL TIME - TWO YEARS)
(FROM 2024 ONWARDS)

INDEX

REGULATIONS FOR MASTER OF ARCHITECTURE

(M.Arch) PROGRAMME

1. **PRELIMINARY DEFINITIONS AND NOMENCLATURE -** In these regulations, unless the context otherwise specifies:
   - **1.1. "Chairman"** means Head of the Body.
   - **1.2. "Course"** means a Theory or Practical subject that is normally studied in a semester, like Landscape Engineering, Theory of Virtual Architecture, Regional Planning, etc.
   - **1.3. "Head of the Department"** means Head of the concerned Department of the Institution in which the programme is taught.
   - **1.4. "Head of the Institution"** means the Director/ Principal of the Institution in which the programme is taught.
   - **1.5. "Programme"** means PG Degree Programme e.g. M. Arch. in Advanced Architecture, M. Arch. in Landscape Architecture, M.Arch in Urban design, etc.
   - **1.6. "Programme Coordinator"** means a faculty member from the same specialization of the Teaching Institution, who will be the overall in-charge regarding all matters concerning the students' academics and progress.
   - **1.7. "Programme Structure/ Curriculum"** means a set of courses, offered, that are mandatorily required to complete an area of specialization.
   - **1.8. "Scheme"** means an interpretation of syllabi for a particular programme and can be used as a guide throughout the programme period to monitor progress.
   - **1.9. "Specialization"** means a discipline of the M. Arch programme like Advanced Architecture, Landscape Architecture, Urban Design, Digital Architecture, etc.
   - **1.10.** "University" means Mahatma Gandhi University, Kottayam.

2. **ELIGIBILITY FOR ADMISSION TO MASTER OF ARCHITECTURE (M.ARCH.) PROGRAMME**
   - **2.1.** Candidates who have been awarded or qualified for the award of Bachelor's degree in Architecture or equivalent courses recognized by the Council of Architecture (COA), with 55% minimum marks in aggregate, from an Institution approved by COA shall be eligible for admission to the M.Arch. Programme.
     For SC/ST candidates a pass in the relevant Degree course is sufficient.
   - **2.2.** Eligibility of candidates shall be decided from time to time by following the guidelines issued by COA and the Government of Kerala.
   - **2.3. **Reservation of seats**
     - 2.3.1. 30% Seats are reserved for candidates belonging to Socially and Educationally backward Classes (SEBC). Candidates belonging to SEBC (OBC) and OEC shall produce a certificate to the extent that the candidate belongs to the community which is designated as an SEBC (OBC) / OEC and does not belong to the category of Creamy Layer.
     - 2.3.2. 10% Seats are reserved for SC/ST Candidates. (SC-8%, ST-2%)
     - 2.3.3. The seats reserved for each category will be distributed among the eligible communities by observing the pattern of general reservation rules of the state of Kerala.
     - 2.3.4. 5% seats are reserved for differently abled candidates.

     **Subject to changes as per Government orders from time to time.
   - **2.4. Other important criteria**
     - 2.4.1. The candidate shall be an Indian National.
     - 2.4.2. The candidates should have studied the Graduate course in an institution approved by the Council of Architecture in India.
     - 2.4.3. Candidates should have a minimum of 55% aggregate marks in B.Arch. Degree examination. For SC/ST candidates a pass in the B.Arch. Degree courses are sufficient. For SEBC (OBC) students, minimum of 54% aggregate marks in the B.Arch. Degree examination is mandatory.
     - 2.4.4. Candidates, who have passed AIIA Examination and satisfying the following conditions, are eligible for admission, subject to the following Conditions.
       a. They must have a valid GATE score.
       b. Attainment of minimum 50% marks for AIIA examination.
     - 2.4.5. Candidates who have appeared for the final semester examination can also apply, provided he/ she has passed all the subjects up to and including the 8th semester for B.

Arch Programme. Confirmation of admission of such candidates shall be subject to the production of qualifying degree before the date stipulated by the University.

2.4.6. Admission shall normally be restricted to those with valid GATE score. However, this stipulation is relaxed in the case of Sponsored candidates.

2.4.7. In case seats remain vacant due to lack of candidates with valid GATE score, candidates from Kerala State without valid GATE score will be considered against such vacancies. If seats are still remaining vacant, candidates from other states will be considered for admission.

2.4.8. Candidates should produce a conversion formula of their CGPA score if the same is not specifically stated in the Mark list or Certificate.

2.4.9. Sponsored candidates from Industries, R&D organizations, National Laboratories, State/ Central Government Departments as well as Educational Institutions, with a Bachelor's degree in Architecture as per the Eligibility Criteria stated above shall be eligible for admission to the M. Arch. programme.

2.4.10. Foreign nationals whose applications are received through Indian Council of Cultural Relations, Government of India and who possess a Bachelor's degree in Architecture from a recognized University are also eligible for admission to the M. Arch. Programme.

2.4.11. Candidates qualified in GATE and admitted to the M Arch Programme shall be eligible to receive Half Time Teaching Assistantship (HTTA)as per rules of AICTE, Ministry of Human Resource Development (MHRD).

2.4.12. Announcements regarding admission to M. Arch. Programme shall be made by the Director of Technical Education (DTE), Government of Kerala. In the case of private self-financing architectural colleges of the state, the colleges concerned shall make admission announcements.

3. SELECTION OF CANDIDATES FOR ADMISSION

3.1. Selection of candidates for the M. Arch. Programme shall generally be done centrally or monitored by the Directorate of Technical Education as per the guidelines given on this by the Government of Kerala.

3.2. For Government Colleges/ Government Aided Colleges:

3.2.1. Candidates will have to register their option while submitting the application.

3.2.2. The selection of Candidates will be supervised by the selection committee consisting of the Director of Technical Education (Chairman), the Senior Joint Director (ECS) and the Principal, College of Engineering, Thiruvananthapuram. The Principal, College of Engineering, Thiruvananthapuram will be the coordinator and venue of admission process will be College of Engineering, Thiruvananthapuram.

3.2.3. Selection of candidates will be based on the GATE score. In case of a tie, advantage will be given to the candidates who secure the highest aggregate percentage of marks up to 8th semester in their qualifying examination.

3.2.4. If a sufficient number of qualified candidates are not available, the selection will be made from Keralite candidates based on the aggregate percentage of marks up to 8th semester in their qualifying examination. Candidates who produce Nativity Certificate in original at the time of admission will only be admitted in such cases. A Rank List will be published based on the GATE Score/Percentage of marks. Candidates are requested to verify their branch/Marks/Category etc. at the time of publishing draft Rank List. After finalizing the Rank List, alterations will not be entertained on any account.

3.2.5. Allotment list will be published in the websites, www.dtekerala.gov.in and www.cet.ac.in.

3.2.6. Allotment letter can be downloaded from the website www.dtekerala.gov.in or www.cet.ac.in. Selected candidates have to remit the fee on or before the last date in any of the specified branches of State Bank of India. Otherwise, the admission will be cancelled.

3.2.7. Sponsored candidates, if any, will be admitted as per relevant Government Orders.

3.2.8. Transfer Certificate issued from the institutions last attended must be produced at the time of admission.

3.2.9. The selection of candidates will be provisional and subject to verification of original documents by the Principal concerned at the time of admission.

3.2.10. Candidates who get college changes in the subsequent allotments, including spot admission by the DTE, are to be relieved in time. The amount collected from such candidates by the respective institutions should be refunded in full.

3.3. For Private Self-Financing Institutions

3.3.1. Institutions shall conduct admission by themselves after inviting separate applications and ascertaining the eligibility for admission as per the norms of the University and Directorate of Technical Education/ Government of Kerala, and following the statutory reservation policy.

3.3.2. For filling up of 50% Seats, the Principal concerned should resort to the Rank List published by the Directorate of Technical Education, and in the absence of candidates in the Rank List by Directorate of Technical Education, other eligible candidates from the Rank List prepared by the institutions can be considered.

3.3.3. Selection will be made Institution wise from the rank list prepared by that Institution on the basis of the marks scored in qualifying examination from among the candidates who have applied. Portfolios of candidates shall be verified to ascertain their attainments during B.Arch. Degree Course and profession.

3.3.4. Transfer certificate issued from the Institution last attended shall be produced at the time of counselling or admission.

3.3.5. The selection of candidates will be provisional and subject to verification of original documents by the Principal of the concerned Institution at the time of admission.

3.3.6. Admission shall be complete only on meeting all the other requirements mentioned in the letter of admission and on payment of the fees.

3.3.7. The number of candidates to be admitted to each M. Arch. stream shall be as per the approval of the University which shall be based on the decision given by the Council of Architecture.

3.3.8. All admissions shall be governed by the procedure laid down for this by the Director of Technical Education, Kerala and the Government of Kerala.

3.3.9. Notwithstanding all that is stated above; the admission policy may be modified from time to time by the University, particularly to conform to directions from the Council of Architecture, Government of Kerala and the Government of India.

4. MEDIUM OF INSTRUCTION

The medium of Instruction and Examinations (Written examination, Jury and Viva Voce), unless otherwise specified, shall be English.

5. DURATION OF THE COURSE

5.1. The normal duration of the M Arch. Degree Course shall be spread over a period of 24 months consisting of four semesters for the full time course.

5.2. Maximum period for the successful completion of the course is four years. Students who fail to complete the course within the stipulated maximum period will have to discontinue the course. Duration is calculated from the day of commencement of classes of first semester. (Regulation clause 17.15).

5.3. Span of a semester shall be six months including the University Examinations.

6. ELIGIBILITY FOR THE AWARD OF DEGREE

Students for the award of Degree of Master of Architecture shall be required to have undergone the course as a regular student in an institution approved by the Council of Architecture and affiliated to the University. He/She shall successfully complete and pass the prescribed course of specialization of not less than four semesters as per the Regulations, Programme Structure and Scheme and Syllabi.

7. PROGRAMME CO-ORDINATOR

To help the students in planning their courses of study and for getting general advice on academic programme, the concerned Teaching Institution shall assign a Programme Coordinator pertaining to each specialization for M.Arch. Programme. The Programme Coordinator, a faculty member from the same specialization, shall be the overall in-charge regarding all matters concerning the students' academics and progress.

8. COURSES OF THE PROGRAMME

The Courses of study of each Programme shall be in accordance with the prescribed Programme Structure, Scheme and Syllabi, of the particular specialization, implemented with effect from 2019 – 20 admissions onwards.

9. COURSE PLAN

The Teaching Institution shall publish Course Plans/Teaching Plans for all subjects as per the Programme scheme and Structure except for Professional Training. Such course plans, approved by the Head of the Institution, shall be duly published within two weeks of commencement of the semester. The course plan preparation shall suit the Academic Calendar published by the University every year.

10. PROGRAMME STRUCTURE (CURRICULUM)

10.1. The M. Arch. Programme in all specializations shall be structured on a credit based system following the semester pattern with Continuous Assessment. The Programme Structure shall comprise the courses of study as given in the Scheme in accordance with the prescribed Syllabi of the particular specialization.

10.2. A common course structure for the M. Arch. Programme shall be followed and it shall generally consist of the following:

- Studio Courses
- Core Courses
- Elective Courses
- Professional Training
- Dissertation
- Thesis

10.3. Every stream of specialization in the programme will have a Programme Structure/ curriculum and syllabi for the courses. The Programme Structure/ 1 curriculum shall be so drawn up that the number of credits for successful completion of the M. Arch. Programme is between 90 and 120.

11. REQUIREMENT OF ATTENDANCE AND COURSE COMPLETION

11.1. A candidate shall be deemed to have completed the requirements of study of any semester and permitted to appear each University Examination (UE) only if,

a. The candidate has attained not less than 80% of attendance in each of the courses of the total number of working days of the concerned semester.

b. He/She attains a minimum of 50 % of Continuous Assessment (CA) marks for each course.

11.2. A student who could not attain the minimum attendance and CA requirements as per Regulation clause 11.1 shall not be permitted to appear for the University Examination (UE) and he/she has to redo the course/courses at the next available opportunity.

11.3. A candidate is eligible for condonation of shortage of attendance subject to the conditions given below.

a. Condonation for a particular semester shall be granted only once in the entire Programme duration and that too only on medical grounds provided, he/she has secured not less than 65% of attendance in each of the courses.

b. Condonation shall be granted only on the recommendation of the Head of the Institution and subject to rules and procedures prescribed by the University from time to time.

c. It is open to the Vice Chancellor to grant condonation of shortage of attendance on the recommendation of the Head of the Institution.

11.4. A student who is not eligible for condonation (of shortage of attendance) shall repeat the semester in full including the CA work in the next immediate chance. The CA marks earned during repetition of semester alone shall be counted in such cases.

11.5. A student can repeat a semester only once in the entire duration of study, for medical reasons (hospitalization / accident / specific illness). The hospitalization must be informed by the parent in writing with the certificate obtained from the Government medical officer to the Programme Coordinator, Head of the Department and Principal within fifteen days of hospitalization.

11.6. However, a candidate can repeat the semester or have condonation of attendance or temporary break of study, only once during the entire programme. He/She shall be entitled to enjoy the benefits of any one of these options only during the entire Programme duration.

11.7. He/She shall repeat the individual course in full (including CAs) in a particular semester/year once and within six consecutive semesters.

11.8. He/She shall not be allowed to repeat the course of any semester if he/she has already passed that semester examination in full, for the improvement of credits.

Note: As these are academic mandatory prerequisites no exemption shall be granted in these cases whatever may be the cause.

12. ACADEMIC EVALUATION: CONTINUOUS ASSESSMENT (CA)

12.1. Marks awarded for the Continuous Assessment shall be on the basis of day-to-day work, periodic tests and assignments/projects. The Continuous Assessment for the individual courses of a particular specialization for each semester shall be carried out as described in the Scheme of the respective specialization.

12.2. The CA marks allotted for attendance for any course shall be awarded full only if a student has secured 90% attendance in that course. Proportionate reduction shall be made in the case of course(s) in which he/she gets below 90% of the attendance.

13. ACADEMIC EVALUATION: UNIVERSITY EXAMINATION (UE)

13.1. There shall be University Examination [UE] at the end of each semester. The University Examination [UE] shall be Written Examination or Jury.

13.2. There is no provision for improvement for University Examination [UE].

13.3. Regular and Supplementary Examinations for all courses shall be conducted in all semesters.

13.4. Academic Evaluation: Final Jury and Viva Voce

13.4.1. For M.Arch Specializations in which studio/workshop/lab based courses are involved,

University Examination (UE) shall be done as a Final Jury or Viva-Voce, for those students who become eligible as per Regulation clause 11.1. The student's work in the form of report/seminar/sheets shall be evaluated by a committee, and the jury shall be conducted as described in the Scheme of the particular specialization.

13.4.2. The Final Jury of all studio/workshop/lab-based courses shall be conducted by the institution as per the Course plans published. However, the date of the last jury in these courses shall not be later than fifteen days prior to the commencement of the Written University Examinations of the particular semester.

13.4.3. A student who has appeared for the Main Jury and could not get 50% aggregate marks

(C.A. + Final Jury) for the course shall be provided Supplementary chance/s as per University Rules. In the supplementary chance the student shall get an opportunity to improve the original portfolio and get it revaluated. In this event, Regulation clause 17.12 shall be applicable.

13.5. Academic Evaluation: University Examinations

13.5.1. For theory courses, the University Examination [UE] shall be a Written Examination. The Chairman/ Chairperson for Examinations shall be appointed by the University and selected from among the senior faculty members having specialization in concerned discipline from its affiliated colleges.

13.5.2. The University examinations for Group II subjects under M. Arch degree course from 2019-20 admissions onwards shall be conducted as per the Question Bank system of the University.

13.5.3. **Attendance:**
A student shall be permitted to appear for the University Examination only if he/she satisfies the attendance requirements as described in Regulation Clause 11.1

13.5.4. To conduct all the Written University Examinations, a Chief Superintendent and an Assistant Chief Superintendent from senior faculty members are to be appointed by the principal on prior approval by the University.

13.5.5. An Observer from among the Senior Faculty of Government Colleges / Aided colleges,
affiliated to Mahatma Gandhi University or University Departments, Centers or Schools under Mahatma Gandhi University, shall be appointed by the University for observing the conduct of Written Examinations.

13.5.6. **Duties of the Observer**
The observer along with the chief superintendent at the center has to ensure the smooth conduct of examinations. It is the joint-responsibility of the chief superintendent and the observer to:

a. Verify the sealing on the packets containing question papers, prior to the commencement of each examination.
b. Note the serial numbers / code of the answer books and additional sheets supplied on each day/ examination.
c. Ensure that sufficient numbers of invigilators are deployed in each examination hall.
d. Visit the examination halls during examination to ensure proper invigilation by the invigilators.
e. Report malpractices / irregularities / insufficiencies if any, through proper channels.
f. Verify the number of answer books with the attendance statement, for each examination.
g. Ensure that the bundles of the answer scripts are properly sealed and signed immediately after the examination.
h. Send the answer scripts to the University at the earliest. If there is any delay in sending the answer books, they should be kept in safe custody at the center till they are sent.

13.5.7. **Valuation**
For written University Examinations, the university shall appoint a Chief Examiner and Additional examiners for each course. The answer sheets valued by the Additional Examiner/s shall be verified by the chief examiner.

13.5.8. **Revaluation**
Students may apply for revaluation in case needed, as per the rules of the University.

14. PROFESSIONAL TRAINING

14.1. If any particular specialization requires Professional Training, the same shall happen between any two semesters, the details of which shall be described in the Scheme of the particular Specialization.

15. RESEARCH METHODOLOGY & DISSERTATION (Not applicable for M.Arch in Advanced Architecture):

15.1. In a specific semester, as described in the Scheme of the particular Specialization, the students shall undergo a course on Research Methodology & Dissertation as well as writing of technical papers. As part of this course, the students shall choose a topic of interest for dissertation and shall carry out independent research on a focused research question/ hypothesis, under the guidance of a faculty member, assigned by the Head of the Department/ Teaching Institution. Students have to register for the Dissertation and select a topic in consultation with the guide. A detailed synopsis on the topic of the dissertation and

technical paper are to be prepared in the prescribed format given by the Teaching Institution.

15.2. Continuous Assessment shall be done by the Guide and the Course in Charge as prescribed in the Course Plan. An Interim Evaluation shall be conducted in the middle of the semester and the Final Evaluation at the end.

15.3. The Final Evaluation shall be based on the dissertation presentation, dissertation report and technical paper and it shall be evaluated by a two-member committee with the Head of the Department/Teaching Institution or his/ her nominee who is an internal faculty, and an external expert, at least a post graduate in the subject, constituted by the Head of the Department/Teaching Institution.

16. THESIS

16.1. In the fourth semester, the students shall choose a topic of interest for Thesis, preferably related to the dissertation work or Research topic done previously, in consultation with the guide, who is a faculty member, assigned by the Head of the Department/ Teaching Institution.

16.2. The thesis shall be an original work and the same could be design centric or planning centric or research centric. Continuous Assessment shall be done by the Guide and a two-member committee. Progress of the thesis work is to be evaluated during the fourth semester, at least THRICE, by a two-member committee consisting of an internal faculty other than the Guide and an external expert, constituted by the Head of the Department/ Teaching Institution. The external expert, at least a Post Graduate, shall preferably be from the same Specialization and shall hold a valid COA Registration.

16.3. Final evaluation of the thesis shall be taken up only if the student has earned all course credits listed in the first two semesters and earned a minimum of 50% marks in the Continuous Assessment for the Thesis work.

16.4. For the conduct of Final evaluation, the University shall appoint a Chairman from among the Heads/Senior most Professors in Architecture of the Teaching Institutions, on a rotation basis. The Chairman shall prepare a provisional list of External and Internal Jurors from the same specialization, one each for every 10 students, for the conduct of External Jury, and submit to the University for Ratification and release of appointment letters. The External Juror shall have a minimum of 10 years practical/teaching experience after registration with COA and minimum of five years teaching/practical experience in the particular specialization after Post Graduation. The External Jury consisting of one External Juror and one Internal Juror appointed by the University shall conduct the Thesis and Viva Voce Examination, as per the University declared Schedule.

16.5. Supplementary chances shall be given to the students who failed in the final Jury.

17. PASSING REQUIREMENTS AND PROVISIONS

17.1. All credits as specified in the Programme Structure/Curriculum should be earned by a candidate to be qualified for the degree.

17.2. The candidate should have cleared all dues to the institute/University.

17.3. No disciplinary action is pending against him/her.

17.4. Passing requirement for a student for all courses shall be a minimum of 50% marks (UE and CA put together), subject to a minimum of 40% marks for the UE.

17.5. A candidate, who is absent or secures a grade F or less than 40% in UE in any course shall retain secured CA marks for subsequent supplementary appearance in the examination of that course.

17.6. A candidate who fails to submit the report on the Professional Training within the prescribed date (or whose report is not accepted for reasons of incompleteness or other serious deficiencies) shall have to register, redo the Professional Training and submit the report at the end of a subsequent semester.

17.7. A candidate who successfully completes the course satisfying all the passing requirements of the courses shall be declared to be qualified for the award of M.Arch Degree for the particular specialization.

17.8. Candidates who have passed all courses of the four semesters at the first opportunity within four consecutive chances after the commencement of his/her study shall be ranked

based on the CGPA obtained. In the case of a tie in the CGPA the total marks of the students who have secured the same CGPA shall be considered for finalizing the rank.

17.9. A candidate who qualifies for the award of M.Arch. Degree having passed all the courses of all the four semesters within a period of maximum six consecutive semesters after the commencement of his/her study and secures a CGPA of 8 and above considering all the four semesters, shall be declared to have passed the M.Arch Degree in FIRST CLASS with DISTINCTION.

17.10. A candidate who qualifies for the award of M.Arch. Degree having passed all the courses of all the four semesters within a period of maximum six consecutive semesters after the commencement of his/her study and secures a CGPA of 6.75 and above considering all the four semesters shall be declared to have passed the M.Arch Degree in FIRST CLASS.

17.11. All other successful candidates shall be declared to have passed the M.Arch Degree in SECOND CLASS.

17.12. In the case of a student (regular / repeated /temporary break study) who has taken a supplementary chance or a make-up jury for passing a course, only minimum pass grade (E) shall be considered in that course for all classification purposes.

17.13. A temporary break of study/ course repeated student who is appearing for a University examination within six consecutive semesters after the commencement of his/her study is considered as first chance and the marks secured shall be considered for all classification purposes.

17.14. A student absents in the first eligible chance / failed in the first appearance in the University examination and subsequently appearing for the University examination in the next chance within six consecutive semesters after the commencement of his/her study, is considered as a supplementary chance.

17.15. Candidates shall be declared to have qualified for the award of the M.Arch degree provided the candidate has successfully completed the course requirements and has passed all the prescribed courses of study pertaining to the four semesters within a maximum period of four years from the commencement of his/her study.

17.16. Minimum for a pass

17.16.1. A candidate shall be declared to have passed a semester examination in full in the first appearance if he/she secures not less than 6 CGPA with a minimum of 'E' grade for the all-individual course in that semester.

17.16.2. A candidate shall be declared to have passed in an individual course of a semester examination if he/she secures grade 'E' or above.

17.16.3. A candidate who does not secure a full pass in a semester examination as per Regulation clause

a. above shall have to pass in all the courses of the semester examination as per Regulation clause

b. above, before he is declared to have passed that semester examination in full.

18. TEACHING ASSISTANTSHIP (Not applicable for M.Arch in Advanced Architecture)

Teaching assistance of three hours per week shall be assigned to each student.

19. ELECTIVES

19.1. There shall be at least 1/3 of students of the sanctioned strength of class for an elective to be offered. The elective may be theory-based course or workshop-based course.

19.2. New electives may be introduced according to the need of emerging fields in technology from time to time. The University shall approve the names of electives and its syllabi before the course offered.

20. TEMPORARY BREAK OF STUDY

20.1. If a candidate intends to temporarily discontinue (allowed only on medical reasons certified by a Government medical officer) the programme in the middle of a semester and intends to re-join the programme later in the respective semester, the candidate shall apply to the University for the permission through the head of the institution with recommendation from the head of the department, before the last date for payment of examination fee of the semester.

20.2. A candidate is permitted to re-join the programme at the respective semester as and when it is offered after the break of study, shall be governed by the rules & regulations and scheme & syllabi in force at the time of re-joining course, subject to the prior approval from the University.

21. EVALUATION

21.1. Credit System

Each course shall have a certain number of credits assigned to it depending upon the academic load and the nature and importance of the course. The credit associated with each course shall be shown in the prescribed scheme and syllabi. Each course shall have an integer number of credits, which reflects its weightage.

21.2. Grading

The University shall award the letter grade to students based on the marks secured by them in both internal assessment/ continuous assessment and semester end examinations taken together in the course's registration. Each letter grade indicates a qualitative assessment of the student's performance and is associated with a specified number of grade points. The grading system along with the grade points for each grade, applicable to passed candidates is shown below. All passed candidates shall be allotted a grade S, A, B, C, D, E, F according to the total marks scored by him/her.

There shall be a continuous evaluation system as described in Regulation Clause 10. On the basis of Continuous Assessment and End Semester Examination, total marks (CA+ESE) for each course is obtained, and a letter grade shall be awarded to each course, where S = 10, A = 9, B = 8, C = 7, D = 6, E = 5, F = 0. "F" denotes failure in the course.
All letter grades except 'F' shall be awarded if the marks for the University examination is 40 % or above and the total mark (CA+UE) is 50 % or above. No absolute marks shall be indicated in the grade card. Letter grade corresponding to total marks (CA+ESE) and the corresponding grade point in a ten-point scale is described below.

% Of Total Marks (CA Marks + University Exam Marks)	Letter Grade	Grade point	Remarks
90% and above	S	10	Excellent
85% and above and less than 90%	A+	9	
80% and above and less than 85%	A	8.5	
75% and above and less than 80%	B+	8	
70% and above and less than 75%	B	7.5	
65% and above and less than 70%	C+	7	
60% and above and less than 65%	C	6.5	
55% and above and less than 60%	D	6	
50% and above and less than 55%	E	5.5	
Below 50% (CA+UE) or below 40% for UE only	F	0	Failed

21.3. Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA)

Semester grade point average is the semester wise average points obtained by each student in a ten-point scale. SGPA for a particular semester is calculated as per the formula shown below.

$$SGPA = \frac{\sum (\text{Course Credit} \times \text{GP obtained for the course})}{\text{---------}}$$

Total Credits of the Semester

21.4. Cumulative Grade Point Average (CGPA) shall be computed for all the students at the end of each semester by taking into consideration their performance in the present and the past semesters as follows:

$$CGPA = \frac{\sum (\text{Total Credits for the Semester} \times \text{SGPA})}{\text{Total Credits for the Programme}}$$

21.5. Grade Card

The grade card issued to the students shall contain course number and course name, credits for the course, letter grades obtained, SGPA for the semester and CGPA up to that particular semester. In addition to the grade cards for each semester all successful candidates shall also be issued a consolidated statement of grades. On specific request from a candidate and after remitting the prescribed fees the University shall issue detailed marks to the individual candidate.

22. REVISION OF REGULATIONS

Notwithstanding all that has been stated above the University has the right to modify any of the regulations, scheme of studies, examinations and syllabi from time to time.

MAHATMA GANDHI UNIVERSITY

KOTTAYAM

SCHEME, PROGRAMME STRUCTURE (CURRICULUM) AND SYLLABUS

FOR

MASTER OF ARCHITECTURE

(FULL TIME- TWO YEARS) IN

ADVANCED ARCHITECTURE

(FROM 2024 ADMISSION ONWARDS)

MASTER OF ARCHITECTURE: ADVANCED ARCHITECTURE

DURATION: TWO YEARS FULL TIME (Four Semesters)

PART B: SCHEME

1. **SCHEME OF THE PROGRAMME**
   The set of Regulations for Master of Architecture (Full Time: Two Years) stipulated is appended by the Scheme, the clauses of which are also mandatory.

2. **PROGRAMME STRUCTURE**

2.1 The Programme has been designed in four semesters of equal credits, for a duration of two years. The course structure consists of Studio Courses, Core Courses, Electives, and Thesis.

2.2 All courses of the M. Arch Degree Course in Advanced Architecture as per the Programme Structure, Scheme and Syllabi are grouped into four groups as stated below:

Group I (a): Courses having evaluation through CA and having a Final Jury conducted by a team consisting of an Internal Juror and an External Juror. The External Juror shall be from among the core faculty of any other B.Arch. institution who possess a Postgraduate Degree in Advanced Architecture or a practicing Architect who possess similar background, registered with the Council of Architecture.

Group I (b): Courses having evaluation through CA and having a Final Jury conducted by a team of Internal Jurors.

Group II: Courses having evaluation through CA and University theory Examination.

Group III: Advanced Architecture Design Thesis.

2.3 CA marks shall be awarded as per the following norms for each group as given below:

Group I (a):	Assignments	80%
	Attendance	20%
Group I (b):	Assignments	80%
	Attendance	20%
Group II	Assignments	30%
	Written exam (Class tests)	50%
	Attendance	20%
Group III	As per Scheme	

2.4 The CA marks allotted for attendance for any course shall be awarded full only if a student has secured 90% attendance in the course. Proportionate reduction will be made in the case of course(s) in which he/she gets below 90% of the attendance for the course(s).

3. **GROUP I(a) COURSES**

3.1 Advanced Design Studio – I, Advanced Design Studio – II, Advanced Design Studio – III

3.1.1. The Evaluation shall be based on Continuous Assessment (CA) and Final Jury as specified in clause Scheme Clauses 2.2. and 2.3.

3.1.2. Eligibility for a candidate to appear for the Final Jury is based on attendance and CA marks. (Refer Regulations Clause 11).

3.1.3. The Final Jury shall consist of the following stages of evaluation:

- Final Jury portfolio and model evaluation.
- Final Jury Viva voce.

3.1.4. The Supplementary chances shall be provided for students who have appeared for the Final Jury and have not passed the same as per the Regulations.

3.1.5. The marks for the Continuous Assessment shall be awarded as per Scheme clause 2.3.

3.1.6. The CA marks and the Attendance obtained by the students shall be officially published twice– mid-semester and at the end of all semesters. The final CA marks shall be published at least one day before the Final Jury.

3.1.7. For the conduct of the Final Jury/Make-up Jury, the head of the Teaching Institution shall nominate, an External Juror as well as an Internal Juror (avoiding repetition), and release

appointment letters to them under intimation to the University. One External Juror and one Internal Juror shall conduct the Final Jury/Make-up Jury, for a batch of 20 or less students.

3.1.8. The Internal Juror shall be a member from among the core faculty of the teaching institution other than the faculty member who evaluated the work for awarding the internal marks.

3.1.9. The External Juror shall be from among the core faculty of any other B.Arch. teaching institutions or an Architect registered with the Council of Architecture, incorporated under Architect's Act 1972 (in both cases with not less than 5-year experience after the date of COA registration). He/ She shall be a practicing architect with similar expertise and possess a minimum of five years teaching/practical experience after Post Graduation in the same specialization.

3.1.10. The faculty-in-charge of the course shall submit a Pre-Jury Report consisting of the details pertaining to the assignments given and its objectives as well as weightage given to each work to the Head of the Teaching Institution, who shall forward the same to the identified Juror Team at least one week before the commencement of the Final Jury/Make-up Jury.

3.1.11. The overall split up, with a suitable scheme of evaluation, of the Final Jury/Make-up Jury marks shall be as stated below:

- For Advanced Design Studio I, II & III
  - Design Portfolio – 90%
  - Viva Voce – 10%

3.1.12. Students shall be physically present during the Final Jury/Supplementary Jury and explain their work done.

3.1.13. The External and Internal Jurors shall have equal weightage in the joint evaluation process.

3.1.14. The Final Jury members shall submit the consolidated marks to the Head of the Teaching Institution on the last day of Jury.

3.1.15. The Final Jury marks shall be published not later than the next working day.

3.1.16. Any student(s) who appeared for the Final Jury and could not get 50 % aggregate mark (CA marks + Jury) shall be provided a Supplementary chance/s as per University Rules. In the supplementary chance, such student(s) shall get an opportunity to present his/her improved portfolio and physical models along with the original ones already presented in the Final Jury and get them re-evaluated by another panel of Jurors comprising of a different External Juror and a different Internal Juror. The student(s) concerned shall submit all the materials to be evaluated in the Supplementary Jury before 4 pm on the previous working day of the Supplementary Jury date. The maximum mark a student can score during the Make-up Jury shall be just enough to make him/her get a pass for the course i.e., not more than 50%.

4. GROUP I(b) COURSES

4.1. Advanced Research in Architecture & Seminar, Advanced Design Visualization Studio

4.1.1. The Evaluation shall be based on Continuous Assessment (CA) and Final Jury as specified in Scheme Clauses 2.2. and 2.3.

4.1.2. Eligibility for a candidate to appear for the Final Jury is based on attendance and CA marks. (Refer Regulations Clause 11).

4.1.3. The marks for the Continuous Assessment shall be awarded by the course in charge as per Scheme clause 2.3.

4.1.4. For every batch of 20 or less students, the Head of the Teaching Institution shall nominate a two-member Jury panel from the faculty (other than the faculty member who evaluated the work for awarding the CA marks) of the Teaching Institution.

4.1.5. Students shall submit the portfolio consisting of the assignments done for the course during the course period, with the approval of the faculty-in-charge of the course on the previous working day of the commencement of the Jury (not later than 3pm).

4.1.6. The faculty-in-charge of the course shall submit a report consisting of the details of assignments given and its objectives and weightage given to each work to the Head of the Teaching Institution, who in turn will forward it to the Jury Panel. The Jurors will evaluate the portfolio and other relevant materials on the basis of the report.

4.1.7. The Internal Jurors shall have equal weightage in the joint evaluation process.

4.1.8. Students shall be physically present and explain their work to the Jury members at the time of evaluating their work.

4.1.9. The split up of the evaluation shall be as stated below:

- Portfolio/Test – 80%
- Viva Voce – 20% (related to the various projects/work done during the particular semester).

4.1.10. Students who could not score a minimum of 50% for the course shall repeat the Jury as a supplementary chance along with the next odd/even batch(es) of students with an improved portfolio.

4.1.11. The Jury members shall submit the consolidated marks to the Head of the Teaching Institution on the last day of Final Jury Evaluation.

4.1.12. The Jury marks shall be published on the next working day.

4.2. Elective I (Workshop)

4.2.1. During Semester I, II & III the students are offered Workshop Based Elective Course as prescribed in the Program Structure and Syllabi. For workshop based elective courses, students need to undergo the coursework as mentioned in the syllabus.

4.2.2. Self-initiatives and participation in specific student learning exposures, both within and outside the campuses are encouraged.

4.2.3. The Evaluation shall be based on Continuous Assessment (CA) and Final Jury as specified in clause Scheme Clauses 2.2. and 2.3.

4.2.4. Eligibility for a candidate to appear for the Final Jury is based on attendance and CA marks. (Refer Regulations Clause 11).

4.2.5. The marks for the Continuous Assessment shall be awarded by the course in charge as per Scheme clause 2.3.

4.2.6. For every batch of 20 or less students, the Head of the Teaching Institution shall nominate a two-member Jury panel from the faculty (other than the faculty member who evaluated the work for awarding the CA marks) of the Teaching Institution.

4.2.7. Students shall submit the portfolio consisting of the assignments done for the course during the course period and the report on the workshop undertaken, with the approval of the faculty-in-charge of the course on the previous working day of the commencement of the Jury (not later than 3pm).

4.2.8. The course-in-charge of the course shall submit a report consisting of the details of assignments given and its objectives and weightage given to each work to the Head of the Teaching Institution, who in turn will forward it to the Jury Panel. The Jurors will evaluate the portfolio and other relevant materials on the basis of the report.

4.2.9. The Internal Jurors shall have equal weightage in the joint evaluation process.

4.2.10. Students shall be physically present and explain their work to the Jury members at the time of evaluating their work.

4.2.11. The split up of the evaluation shall be as stated below:

- Portfolio/Test – 80%
- Viva Voce – 20% (related to the various projects/work done during the particular semester).

4.2.12. Students who could not score a minimum of 50% for the course shall repeat the Jury as a supplementary chance along with the next odd/even batch(es) of students with an improved portfolio.

4.2.13. The Jury members shall submit the consolidated marks to the Head of the Teaching Institution on the last day of Final Jury Evaluation.

4.2.14. The Jury marks shall be published on the next working day.

4.3. Professional Training

4.3.1. Professional Training under a practicing Architect with experience with the same specialization, is a necessary component of the Programme, which equips the student with the practical aspects, offering the required exposure to the realm of the profession and research, before he/she takes up the Thesis.

4.3.2. The training shall be under a practicing Architect with experience in the same specialization and approved by the Head of the Teaching Institution. The student shall undergo Internship in advance before the commencement of the IV semester.

4.3.3. The Architect shall possess a valid COA Registration, and shall have minimum five years of experience in the similar Architectural field. He/She should not be an architect employed in the public sector or a regular faculty member of the Teaching Institution or immediate relative of any regular faculty member of the Teaching Institution. The Architect shall not be a relative of the trainee also. Further the training firm shall in no way be associated with the Teaching Institution.

4.3.4. Students may also select internationally recognized Architects practicing outside India, with the approval of the Teaching Institution.

4.3.5. Type of works to be carried out during training period. The students are expected to get exposure in the following aspects:

- Involvement in the Design process.
- Site visit and Site Supervision.
- Preparation of working drawings.
- Preparation of estimates, specifications, contract documents, and tender documents.
- Discussion with clients and other consultants.

4.3.6. Work report: The students shall obtain a report of the work done to the course-in charge of Professional Training of the Teaching Institution. The report shall be duly signed by the Architect or an authorized officer supervising the work in the format prescribed by the teaching institution.

4.3.7. The Evaluation shall be based on Continuous Assessment (CA) and Final Jury as specified in clause Scheme Clauses 2.2. and 2.3.

4.3.8. Eligibility for a candidate to appear for the Final Jury is based on attendance and CA marks. (Refer Regulations Clause 11).

4.3.9. The marks for the Continuous Assessment shall be awarded by the course in charge as per Scheme clause 2.3.

4.3.10. The assignments shall include Work Dairy, Work Report and Portfolio.

4.3.11. The Final Jury evaluation of the Professional Practice shall be conducted at the end of IV semester.

4.3.12. At the end of the Professional training period, the students shall submit to the Teaching Institution a portfolio as specified by the institution. This shall consist of the complete report of their work done during the entire training period illustrated with sketches, prints and other documents related to the projects on which he/she has involved both in office and at site, a work diary, original of the work report, a certificate regarding their conduct and performance of work done during the training period and regarding the successful completion of training under the approved Architect /Firm. In the absence of the above document's students shall not be permitted to appear for the final evaluation.

4.3.13. The split up of the evaluation shall be as stated below:

- Portfolio, Work Diary, work report– 80%
- Viva Voce – 20% (related to the various projects/work done during the particular semester).

4.3.14. For every batch of 20 or less students, the Head of the Teaching Institution shall nominate a two-member Jury panel from the faculty (other than the faculty member who evaluated the work for awarding the CA marks) of the teaching institution.

4.3.15. The Jurors shall evaluate the portfolio and other relevant materials to check the qualitative achievement of the student during the Professional training period.

4.3.16. The Internal Jurors shall have equal weightage in the joint evaluation process.

4.3.17. Students shall be physically present and explain their work to the Jury members at the time of evaluating their work.

4.3.18. Students who could not score a minimum of 50% for the course shall repeat the Professional training and appear for the Jury along with the next batch(es) of students with an improved portfolio.

4.3.19. The Jury members shall submit the consolidated marks to the Head of the Teaching Institution on the last day of Final Jury Evaluation.

4.3.20. The Jury marks shall be published on the next working day.

5. **GROUP II COURSES**

5.1. The Group II Courses Include

- **Semester I:** Advanced Sustainable and Green Building Design, Advanced Sustainable, Energy Efficient Building Materials & Technologies, Building Physics & Performance Evaluation of Buildings.
- **Semester II:** Contemporary Processes in Architectural Design: BIM, AI, ML, VR, AR, Theory & Application of Digital Architecture, Advanced Design Optimization Through Algorithms.
- **Semester III:** Advanced Building Systems Integration, Advanced Construction Management and Technology, High-Performance Building Envelopes, Advanced Building Information Modeling (BIM) and Digital Design.

5.2. The Evaluation shall be based on Continuous Assessment (CA) and University Examination (UE) as specified in clause Scheme Clauses 2.2. and 2.3.

5.3. Eligibility for a candidate to appear for the University Examination (UE) is based on attendance and CA marks. (Refer Regulations Clause 11).

5.4. The marks for the Continuous Assessment shall be awarded by the course in charge as per Scheme clause 2.3.

5.5. Conduct and valuation of the University Examination shall be carried out as mentioned in the Regulation Clause 12 and 13.

6. **GROUP III: Advanced Architecture Design Thesis & Research paper Publication & Seminar**

6.1. In the fourth semester, the students shall choose a topic of interest for Thesis, in consultation with the guide.

6.2. The Head of the Teaching Institution shall allot a guide for each student considering the nature of the work and specialization of the faculty member at the beginning of III semester.

6.3. As far as possible, a student's preference may also be considered before allotting the guide. Students admitted to the III semester shall submit their choices of their thesis project within a month after the commencement of the IIIrd semester classes in consultation with the guide.

6.4. Students shall obtain approval for the project of Advanced Architecture Design Thesis from the Teaching Institution.

6.5. Final evaluation of the thesis shall be taken up only if the student has earned all course credits listed in the first two semesters and earned a minimum of 45% marks in the Continuous Assessment.

6.6. The duration of the Advanced Architecture Design Thesis will be six months from the date of commencement of the IV Semester M. Arch Degree Course.

6.7. The thesis shall be an original work and the same could be design centric or planning centric or research centric with some design component but the focus can vary as per the scale and type of the project.

6.8. Students are required to maintain a work diary of the thesis work.

6.9. All students are required to schedule their thesis work, get it approved by the guide, at the beginning of the IV semester and submit a copy of the same to the thesis coordinator nominated by the Head of the Teaching Institution.

6.10. Internal evaluation of the thesis work is to be evaluated during the fourth semester, at least THRICE, by a two-member committee consisting of an internal faculty other than the Guide and an external expert constituted by the Head of the Department/ Teaching Institution.

6.11. The External expert in the field of Advanced Architecture or in allied field who possess a valid COA Registration, and shall have a minimum of five years of experience after Post graduation in Advanced Architecture or in allied field.

6.12. The progress shall be assessed by the Jury periodically through a minimum of three stages of reviews, the dates of which will be published by the Teaching Institution before the commencement of the IV semester.

6.13. Each review shall be graphical (including models) and oral presentation.

6.14. Students have to obtain a total of 50% marks combining all the stages of reviews to become eligible for the external Jury. Those who do not become eligible to appear for the External Jury shall have to repeat the course fully with the next batch(es) of students.

6.15. Split up of marks for internal evaluation shall be done as specified in the course plan.

6.16. The following Documents shall be submitted for the External evaluation Final Jury:

- Two copies of the Data Collection in the preliminary design stage (up to the design and including the case studies) shall be compiled and presented along with the final submission in A3 size format.
- Two copies of the Final Report (including the design sheets) in A3 size format shall be submitted on the date and time announced by the Teaching Institution.
- Soft copy of the report and the design sheets as specified by the Teaching Institution.

6.17. The total sheets submitted shall not exceed 30 (thirty) sheets of suitable size. These shall be submitted as per the schedules published by the University.

6.18. Physical Models shall be submitted on the date of Viva Voce examination, at least by 8 am.

6.19. The format and other instructions regarding the schedule of reviews, preparation of the bound volumes of Data Collection, Final Report, Final Sheets, Model, etc. will be announced by the Teaching Institution.

6.20. For the conduct of Final evaluation, the University shall appoint a Chairman from among the Heads/Senior most Professors in Architecture of the Teaching Institutions, on a rotation basis. The Chairman shall prepare a provisional list of External and Internal Jurors from the same stream, one each for every 10 students, for the conduct of External Jury, and submit to the University for Ratification and release of appointment letters. The External Juror shall have a minimum of 10 years practical/teaching experience after registration with COA and minimum of five years teaching/practical experience in the particular stream after Post Graduation. The External Jury consisting of one External Juror and one Internal Juror appointed by the University shall conduct the Thesis and Viva Voce Examination, as per the University declared Schedule.

6.21. The Chairman shall visit the venues of External evaluation in all the centers and carry out a random verification of the evaluation being carried out by the other Jury members. The Jury members (excluding the chairman) shall submit the consolidated marks to the Chairman on the last day of Viva Voce and the Chairman should submit the mark sheet directly to the University.

6.22. Students shall secure 40% of marks in the external Jury and 50% aggregate (Internal +for successfully completing the thesis and Viva voce.

6.23. Supplementary chances shall be given to the students who failed in the final Jury as per University Norms.

PROPOSED MG UNIVERSITY DETAILED SCHEME, PROGRAM

STRUCTURE (CURRICULUM), SYLLABUS, MANUAL & REGULATIONS

MASTER OF ARCHITECTURE (ADVANCED ARCHITECTURE)

2 YEAR FULL TIME

M.ARCH COURSE

2024

Concept Note for the M. Arch: Masters in Advanced Architecture Design Course

The evolution of architecture in the 21st century has been marked by a profound integration of technology, sustainability, and innovation. The demand for architects who can harness cutting-edge tools and methodologies such as Building Information Modeling (BIM), Artificial Intelligence (AI), and Parametric Modeling has never been higher. The Master of Advanced Architecture Design program is conceived to address this need and prepare architects to lead in a rapidly changing and technologically-driven built environment.

The program aims to equip students with the skills, knowledge, and mindset required to excel in the dynamic field of advanced architecture design. The program focuses on three key pillars:

Technological Proficiency:

In-depth training in BIM, AI, and Parametric Modeling.
Hands-on experience with industry-standard software and tools.
Integration of technology into the entire architectural design process.

Advanced Sustainability:

Comprehensive understanding of sustainable design principles.
Exploration of innovative materials and construction technologies.
Application of sustainable practices in real-world architectural projects.

Theoretical and Practical Exposure:

Balanced coursework covering theoretical concepts and practical applications.
Collaborative projects with industry partners to provide real-world challenges.
Internships and site visits to gain firsthand experience in the field.

Benefits of the Program:

Holistic Skill Development: Graduates will possess a well-rounded skill set, integrating design, technology, and sustainability in their architectural practice.

Industry-Relevant Training: The curriculum is designed in consultation with industry experts to ensure alignment with current and future industry needs.

Global Perspective: Exposure to international best practices through collaborations with renowned architectural firms and exposure to global case studies.

Career Advancement: Graduates will be prepared for leadership roles in architectural firms, sustainable design consultancies, and other related fields.

PROGRAM STRUCTURE (SEMESTER WISE)

FIRST SEMESTER

(**Focus Area:** Sustainability, Energy Efficiency & Green Building Design)

Course Code	Subject	Hours/Week			Credits	Marks			
		Theory (T)	Studio (S)	Workshop/Lab (W/L)	Total Credits: 25	CA	University Exam		Total
							Jury	Written	
CORE COURSES									
24AA10001	**Advanced Sustainable & Green Building Design**	2			2	50	-	100	**150**
24AA10002	**Advanced Sustainable, Energy Efficient Building Materials & Technologies**	2		1	3	50	-	100	**150**
24AA10003	**Building Physics & Performance Evaluation of Buildings**	1		2	3	50	-	100	**150**
24AA10004	**Research in Advanced Architecture**	1		2	3	50	100	-	**150**
ELECTIVE THEORY – I									
	ELECTIVE - I	**Students to choose any one from Elective - I**							
24AA1ELA1	**Environmental Law & Legislations**	2			2	50	50	-	**100**
24AA1ELA2	**Adaptive Reuse & Retrofit of Buildings**	2			2	50	50	-	**100**
ELECTIVE THEORY - II									
	ELECTIVE - II	**Students to choose any one from Elective - II**							
24AA1ELB1	**Sustainable & Cost-Effective Housing**	2			2	50	50	-	**100**
24AA1ELB2	**Disaster Management**	2			2	50	50	-	**100**
STUDIO									
24AA10005	**Advanced Design Studio – I**	2	8		10	150	150	-	**300**
								Total Marks:	**1100**

SECOND SEMESTER

Focus Area: Contemporary Processes & Technology in Architectural Design

Course Code	Subject	Hours/Week			Credits	Marks			
		Theory (T)	Studio (S)	Workshop/Lab (W/L)	Total Credits:25	CA	University Exam		Total
							Jury	Written	
CORE COURSES									
24AA20001	**Contemporary Processes In Architectural Design: BIM, AI, ML, VR, AR**	2	-	-	2	50	-	100	**150**
24AA20002	**Theory & Application of Digital Architecture**	1	-	2	3	50	-	100	**150**
24AA20003	**Advanced Design Visualization Studio**	1	-	2	3	50	100	-	**150**
24AA20004	**Advanced Design Optimization Through Algorithms**	1	-	2	3	50	-	100	**150**
ELECTIVE THEORY - III									
	Elective Theory - III	**Students to choose any one from Elective - III**							
24AA2ELC1	**High End 3d Modelling**	-	-	2	2	50	50	-	**100**
24AA2ELC2	**Smart Materials**	1	-	1	2	50	50	-	**100**
ELECTIVE THEORY- IV									
	Elective Theory - IV	**Students to choose any one from Elective - IV**							
24AA2ELD1	**Advanced Biomimetic Architecture**	2	-	-	2	50	50	-	**100**
24AA2ELD2	**Digital Fabrication**	-	-	2	2	50	50	-	**100**
STUDIO									
24AA20005	**Advanced Design Studio – II**	2	8	-	10	150	150	-	**300**
								Total Marks:	**1100**

THIRD SEMESTER

FOCUS AREA: Advanced Building Systems, Construction & Technology

Course Code	Subject	Hours/Week			Credits	Marks			
		Theory (T)	Studio (S)	Workshop/Lab (W/L)	Total Credits: 25	CA	University Exam		Total
							Jury	Written	
CORE COURSES									
24AA30001	Advanced Building Systems Integration	2	-	-	2	50	-	100	150
24AA30002	Advanced Construction Management & Technology	2	-	1	3	50	-	100	150
24AA30003	High- Performance Building Envelopes	2	-	1	3	50	-	100	150
24AA30004	Advanced Building Information Modeling (BIM) & Digital Design	1	-	2	3	50	-	100	150
ELECTIVE - V									
	Elective Theory - V	Students to choose any one from Elective - V							
24AA3ELE1	Advanced Artificial Intelligence & Machine Learning In Architecture	2	-	-	2	50	50	-	100
24AA3ELE2	Virtual Reality (VR) and Augmented Reality (AR) in Architecture	2	-	-	2	50	50	-	100
ELECTIVE - VI									
	Elective Theory - VI	Students to choose any one from Elective - VI							
24AA3ELF1	Technology & Human- Centered Design in Architecture	2	-	-	2	50	50	-	100
24AA3ELF2	Design Thinking and Innovation in Architecture	2	-	-	2	50	50	-	100
STUDIO									
24AA30005	Advanced Design Studio - III	2	8	-	10	150	150	-	300

	Total Marks:	1100

FOURTH SEMESTER: Advanced Architecture Design Thesis

Course Code	Subject	Hours/Week			Credits	Marks			
		Theory (T)	Studio (S)	Workshop/Lab (W/L)	Total Credits: 20	CA	University Exam		Total
							Jury	Written	
CORE COURSES									
24AA40001	Professional Training/Exchange Programme	-	-	4	2	50	100	-	150
24AA40002	Research Paper Publication & Seminar	-	-	3	3	50	100	-	150
STUDIO									
24AA40003	Advanced Architecture Design Thesis	-	15	-	15	250	250	-	500
								Total marks:	800

DETAILED SYLLABUS

FIRST SEMESTER

24AA10001: Advanced Sustainable & Green Building Design

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
1	24AA10001	Advanced Sustainable & Green Building Design	2	-	-	2	50	-	100	150

Course Objectives:

To sensitize about the various aspects of sustainable and green building design in the context of global warming and climate change.

To study the building materials for its impact on environment.

Module 1: Introduction

A historical perspective, General premises and strategies for sustainable and green design, objectives and basis, Bio-mimicry as a design tool based on ecosystem analogy.

Module 2: Green Construction & Environmental Quality

Sustainable architecture and Green Building: Definition, Green building evaluation systems. LEED Certification, Green Globe Certification, Case studies which look at the environmental approach, Renewable Energy, Controlling the water cycle, Impact of materials on environment, Optimizing construction, Site management, Environmental management of buildings.

Module 3: Passive Design in Materials

Passive Design and Material Choice. Traditional Building Materials. Importance of envelope material in internal temperature control. Specification for walls and roofs in different climate. Material and humidity Control.

Module 4: Eco House

The form of the house. The building as an analogy. Building concepts of energy gain/loss. Insulation. Passive and active solar gain. Health benefits. Sustainable materials. Small scale wind and hydro power systems. Case study of an eco-house.

Module 5: Sustainable and Green Building Applications

This module will explore collaborative learning to explore, investigate and apply various parameters of

sustainability for design development of projected building/ urban scenarios.

Outcomes:
An understanding on sustainability. Knowledge on renewable energy conservation through material usage. A thorough understanding on designing green buildings.
References:
1. Ken Yeang: Eco Design- A manual for Ecological design; Wiley Academy, 2006. 2. Sue Roaf et al: Ecohouse, A design guide; Elsevier Architectural Press, 2007. 3. Thomas E Glavinich: Green Building Construction; Wiley, 2008. 4. Brenda and Robert Vale: Green Architecture, Design for a Sustainable Future; Thames and Hudson, 1996. 5. Daniel Vallero and Chris Brasier: Sustainable Design - The science of sustainability and Green Engineering; Wiley, 2008. 6. Striebig Bradly, Engineering Applications in Sustainable Design and development. 7. Yeang, Ken, EcoMasterplanning. 8. Pang Wei, Urban Landscapes. 9. IGBC, Green buildings of India: The pioneers who changed the perspectives. 10. Dhmeja, Suresh K, Environmental studies.

24AA10002: Advanced Sustainable, Energy Efficient Building Materials & Technologies

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
1	24AA10002	Advanced Sustainable, Energy Efficient Building Materials & Technologies	2	-	1	3	50	-	100	150

Course Objectives:

To understand the concept of energy.
To study the building materials and its impact on environment.
To provide an insight into various energy-efficient materials and sustainable construction technology.

Module 1: Energy and the Built Environment

Energy Efficiency. Energy Conservation. Zero Energy. Energy Plus. Recourse Consumption. Distribution of Energy use in India. Factors affecting the Energy use in Buildings. Pre-Building Stage, Construction Stage & Post Occupancy stages. Concept of Embodied Energy. Energy needs in Production of Materials. Transportation Energy. Concept of light footprint on Environment.

Module 2: Environmental Impact of Building Materials

Measuring the impact of building materials. Calculating embodied energy, recycling and embodied energy, processing and embodied energy, time and embodied energy, embodied energy of different building materials. Low energy building and masonry materials, life cycle and analysis (life cycle analysis can be after embodied energy). Case studies and analysis.

Module 3: Recyclable and Renewable Materials

Concept of Recyclable materials. Sustainable Building Materials. Life Cycle Design of Materials. Biodegradable & Non-Biodegradable Materials. Green rating and Building Materials. Concept of Resource reuse. Recycled content. Regional materials. Rapidly renewable materials – fly ash bricks, cement, recycled steel, bamboo-based products.

Module 4: Sustainable Construction

Design issues relating to sustainable development including site and ecology, community and culture, health, materials, energy, and water. Domestic and community buildings using self-help techniques of construction. Adaptation, repair and management. Portable architecture.

Module 5: Energy Efficient Construction Technologies

Energy Efficient Construction Technology. Filler Slab. Rat trap Bond. Technologies developed by CBRI. Traditional Building Construction Technologies. Introduction to other Technological interventions to save energy. Intelligent Buildings. Energy Conservation through technological intervention. Saving energy used for lighting by design innovation. Case studies.

Outcomes:

Insight on environmental impact of building materials.
Understanding of building materials and construction techniques that are sustainable and energy efficient.

References:

1. Koenigsberger O.H, T.G. Inger Soll, "Manual of tropical Housing and Building" Longman Group United Kingdom, 2012.
2. Bansal Naveendra K., Hauser Gerd and Minke Gernot, "Passive Buildings Designs: Handbook of Natural Climatic Control", Elsevier Science, Amsterdam, 1997.
3. Givonji B., "Man, Climate and Architecture", Elsevier, Amsterdam, 1986.
4. Watson Donald, 'Climatic Design: Energy Efficient Building Principles & Practices", Mc Graw Hill Book company, New York, 1993.
5. Tomas Hack, Sustainability Indicators - A Scientific Assessment.
6. Spiegel, Ross, Green building materials: a guide to product selection and specification.
7. LPA, Mainstream Green Sustainable System.
8. Osman Attmann, Green Architecture: Advanced Technologies and Materials.

9. Innovation and Application of Green Building: Materials public buildings
10. Atlas of eco architecture.
11. Innovation and Application of Green building: Materials Public Building.

24AA10003: Building Physics & Performance Evaluation of Buildings

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
1	24AA10003	Building Physics & Performance Evaluation of Buildings	1	-	2	3	50	-	100	150

Course Objective:

To investigate the simulation and audit techniques for assessing the energy performance, environmental response and impact of built form.

Module 1: Introduction to Building Performance Evaluation

Emerging role of performance evaluation in building design and Master Planning. Integrated approach to environmental design. Case studies. Cognitive, analytical and simulated modeling and design of buildings. Net Zero Energy Building.

Module 2: Environmental Assessment Methods and Modelling for Passive Systems (Lab Based)

Modelling and experimental techniques for building assessment/evaluation and design. Basics of thermal comfort, solar shading/access/control, day lighting, acoustics and air movement etc. Issues and opportunities with current assessment modes/evaluation tools. Evaluation assessment based on building type/function and program.

Module 3: Energy Modelling (Lab Based)

Computer based simulation. Building performance with respect to function, program, microclimate, urban planning, envelope design and material. Energy modelling and performance simulation of existing buildings (residential, institutional). Design of a new residential building.

Module 4: Post Occupancy Evaluation of Buildings

Building performance benchmarks. Rating and comparison of buildings. Techniques, methods and procedures of post occupancy evaluation. Students are required to carry out post-occupancy evaluation of a building and document the relationship between building design, energy use, occupant satisfaction, and environmental impact and report their observations. Assessing existing buildings on their energy use, environmental impact and occupant satisfaction.

Module 5: Seminar and Case Study Presentation

Case study presentation of students on performance evaluation of a building identified by the student and approved by the course faculty. Seminar on topics approved by the course faculty.

Outcomes:

Knowledge on environmental assessment methods, audit and simulation techniques.
Addition of value to the architectural design processes and equipping students with energy modeling skills.

References:

1. Energy Audit of Building Systems – Moneef Kranti (Ph. D) – CRC Press 2000
2. Clarke, J.A., Energy Simulation in building design, Adam Hilger Ltd, Bristol, 1985
3. ESRU., "ESP – A Building Energy Simulation Environment; User Guide Version 9 Series. "ESRU Manual U 96/1, University of Starthclyde, Energy Systems Research Unit, Glasgow, 1996.
4. Kabele, K., Modeling and analyses of Passive solar systems with computer simulation, in Proc. Renewable energy sources, PP. 39 – 44, Czech Society for Energetics Kromeriz 1998.
5. James Douglas "Building Adaptation", Elsevier, Oxford 2002.
6. Scott Grinnell, Renewable Energy & Sustainable Design.
7. Yee, Roger, HLW-125 Better Performance by Design.
8. Steven V Szokolay, Introduction to Architectural Science: The basis of sustainable design.
9. Keith J Moss, Energy management buIldings.
10. Clarke, J.A., Energy Simulation in building design, Adam Hilger Ltd, Bristol, 1985

24AA10004: Research in Advanced Architecture

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
1	24AA10004	Research In Advanced Architecture	1	-	2	3	50	100	-	150

Course Objectives:

To learn the importance of research methodology
To understand research application in architectural design.
To understand the different methods and techniques as relevant to the design profession.
To apply the research concepts in evaluation and appraisal of architectural design projects.
To analyze the various methodologies of field survey
To develop the skill of preparation of report and documentation

Module 1: Introduction to Research

Importance, Purpose and Scope of Research and Field Studies. Application in architecture in terms of design, technology, environment, economic and behavioral areas.

Module 2: Research Objectives and Methodology

Sequence and Methods of Research. Identification of Problem, Hypothesis Formulation, Objectives and Methodology.

Module 3: Application of Research

Understanding and Applying Qualitative, Analytical, Interpretative, Correlational, Quasi- Experimental, Experimental, Simulation and Modelling techniques in Architectural Design.

Module 4: Field Studies

Pilot Studies. Field Surveys and Collection of Samples - Physical, Architectural, Environmental, Organizational. Preparation and Analysis of Data Sheets and Questionnaires.

Module 5: Analysis, Preparation and Documentation

Preparation and Analysis of Data Sheets and Questionnaires. Arriving at conclusions from the Research at Field Studies. Report Writing and Publications.

Outcomes:

An understanding of the methods of research
Development of field study and experimentation skills
An understanding of the research application in the field of Architectural Design
An understanding of the process and methods collection of data and analysis of data
Development of documentation skills of various surveys and research
Preparation of documents, report writing and publishing in journals

References:

1. Knight, A. and Ruddock., "Advanced Research Methods in Built Environment", John Wiley & Sons.2008.
2. Groat, L. and Wang D., "Architectural Research Methods", John Wiley & Sons. 2002.
3. Gibbs, J.P., "Urban Research Methods", (rev.ed.) Von Nostrand. 1988.
4. Kothari, C.R., "Research Methodology- Methods and Techniques", New Age International. 2004.

24AA1ELA1: ELECTIVE I (Option 1): Environmental Law & Legislations

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
1	24AA1ELA1	Environmental Law & Legislations	2	-	-	2	50	50	-	100

Course Objective:
To introduce students to various international developments, environmental laws and legislations in India and its current applicability to the society at large.

Module 1: Public Health and Safety
Remedies under law of torts, law of crimes & other common law remedies.
Module 2: The Constitution of India
Salient features, Fundamental Rights and Directive Principles of State Policy, writ petitions, Public Interest Litigations.
Module 3: Environmental Laws and Legislations
Water Act, 1974, Air Act, 1981, Environment Protection Act, 1986, Energy Conservation Act, 2001, Public Liability Insurance Act, 1991 and Biodiversity Act 2002
Module 4: Environmental Notifications and Rules
Coastal Regulation Zones, Eco-Fragile Areas & Zones, Environment Impact Assessment of Development Projects, Eco-Sensitive Zones, Bio-Medical Waste Rules, Hazardous Waste Rules, Municipal Solid Waste and other applicable rules and regulations.
Module 5: End of term assessment
The continuous assessment will be in the form of notes/ assignments, as stipulated above and will be assessed internally.

Outcomes:
An understanding of the current laws related to environment in the Indian context An understanding of the application of the current laws in the context of design and planning
References:
1. Leela Krishnan; Environmental Law in India. 2. Mehta M; Commentary on water and air pollution with environmental protection law. 3. Sarkar S; Legal aspects of regulations in South Asia. 4. Chalifour N; Land use law for sustainable development. 5. Birnie PW and Boyle; International law and the Environment. 6. Saksena K.D; Environmental policies and programs in India. 7. The Kerala conservation of paddy land and wetland act and rules, 2008. 8. The Kerala Municipality Building Rules, 2019. 9. Environment protection laws.

24AA1ELA2: ELECTIVE I (Option 2): Adaptive Reuse & Retrofit of Buildings

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
1	24AA1ELA2	Adaptive Reuse & Retrofit of Buildings	2	-	-	2	50	50	-	100

Course Objective:
To give a comprehensive overview on how existing buildings can be adapted and retrofitted to function sustainably.

Module 1: Sustainable Retrofit for Existing Buildings
Retrofitting options for existing buildings. Structural retrofit. Services. Interior retrofit. Performance analysis of existing buildings. Physical audits. Building simulation. Metering and tracking options. Analysis of the building's current performance. Decision influencers for retrofit. Economic, Social and Environmental issues.
Module 2: Adaptive Reuse of Old Buildings
Need for adaptive reuse. Issues to be explored in building adaption. Economic, Social, Environmental and assessment models for adaptive reuse. Case studies of buildings with adaptive reuse.
Module 3: Technologies for Energy Efficiency in Existing Buildings
Improving energy efficiency in existing buildings. Facade improvements. HVAC improvements. Indoor environment improvements. Monitoring the performance of retrofits. Case studies on energy efficiency improvements in existing buildings.
Module 4: Sustainable Conservation of Heritage Structures
Conservation of heritage structures. Sustainability in heritage structures. Adaptive reuse of heritage structures. Issues in adapting a heritage structure. Use of sustainable conservation techniques. Improving the energy performance of heritage structures. Case studies of sustainable conservation in heritage structures.
Module 5: Retrofitting Tall Buildings for Energy Efficiency
Energy consumption by existing tall buildings. Retrofitting existing tall buildings to make them energy efficient. Case studies of tall buildings such as Empire State Building, Sears Towers etc. which have been retrofitted for energy efficiency.

Outcome:
An understanding of how existing residential buildings, tall structures and buildings with heritage value can be retrofitted for energy efficiency.
References:
1. Sara J. Wilkinson, Hilde Remoy, Craig Langston: Sustainable Building Adaption: Innovations in design making; John Wiley and sons, 2014. 2. John Krigger: Residential Energy: Cost savings and Comfort for Existing buildings; Prentice Hall, 2009. 3. William H. Clark: Retrofitting for Energy Conservation; McGraw Hill Professional, 1997. 4. Paul Apple: Sustainable Retrofit and Facilities Management; Routledge, 2013. 5. Zynep Aygen: International Heritage and Historic Building Conservation: Saving the World's Past; Routledge, 2013. 6. Kain, Roger, Planning for Conservation.

24AA1ELB1: ELECTIVE II (Option 1): Sustainable & Cost Effective Housing

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
1	24AA1ELB1	Sustainable & Cost Effective Housing	2	-	-	2	50	50	-	100

Course Objective:

To provide the students with in-depth knowledge of various building materials, construction and execution techniques in sustainable housing.

Module 1: Introduction to sustainable Housing

Introduction to sustainable housing, building components influencing cost of buildings. Adobe, Cob, Rammed earth, Straw bale, Bamboo, earthen finishes, etc., their sustainability, adaptability to local climate and engineering considerations necessary for durability.

Module 2: Modular Coordination

Modular coordination in building design, total and partial prefabrication, impact of prefabrication on employment. Various methods of mass production of building components.

Module 3: Sustainable Construction Technologies

Building construction technology solutions for cost reduction. Available knowledge in sustainable construction technologies, Institutions developing sustainable construction technologies like BMTPC, CBRI, Auroville Building Center, etc.

Module 4: Time Cost Management

Use of CPM and PERT methods in building construction management. Effect of time-cost relationship in sustainable housing delivery mechanism.

Module 5: Building Cost Reduction

Application of low-cost building materials and various construction techniques, building cost control techniques, research and development by various organizations in the country and foreign countries to reduce the cost.

Outcomes:

The course will make the student conversant with various design systems used in sustainable Housing.

References:

1. Davis, S. “Architecture of Affordable Housing”, University of California Press, 1995.
2. Ruiz, F. P. “Building an Affordable House, Taunton Press, 1995.
3. Laul, A. K. “A Handbook of Low-Cost Housing”, New Age International, 1995.
4. Mathur, G. C. “Low Cost Housing in Developing Countries”, South Asia Book, 1999.
5. Klaus Dunkelberg, IL31- Bambus Bamboo.
6. Greg Kats, Greening our Built World: Costs, Benefit, and Strategies.
7. Arna Mathiesen , Scarcity in Excess: the built environment and the Economic crisis in iceland.
8. Sandra Piesik, Habitat : Vernacular Architecture for a Changing Planet.

24AA1ELB2: ELECTIVE II (Option 2): Disaster Management

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
1	24AA1ELB2	Disaster Management	2	-	-	2	50	50	-	100

Course Objectives:

- To understand the nature and importance of disaster management.
- To gain an understanding hazard and vulnerability assessment, structural and nonstructural mitigation measures for different types of disasters.

Module 1: Introduction to Disaster Management

Paradigm shift in Disaster Management thought. The Disaster Management Cycle. Disaster Impact, Response, Recovery, Development, Prevention, Mitigation and Preparedness. Factoring in Disaster Mitigation with Development Projects.

Module 2: Prevention of Hazard

Types of Natural disasters. Nature, causes, Impact. Hazard and vulnerability assessment, concepts, tools and techniques, Pre-disaster mitigation and protection of lifeline and critical facilities against natural hazards. Manmade hazards in urban areas and their mitigation.

Module 3: Structural and Non-Structural Mitigation Measures

Structural and non-structural methods of mitigation: making buildings resilient to earthquakes, cyclones, tsunami and landslides. Building codes and regulations for earthquake prone areas and coastal zone regulations. Capacity building for architects and masons. Retrofitting existing buildings for disaster resistance. Recent advances in housing technologies: base isolation and shape memory alloys and smart materials for disaster resistance.

Module 4: Institutional Framework for Disaster Management

Environmental policies and programmes, Institutions and National Centers for Natural Disaster Impact Reduction. Environmental legislations in India, awareness, education and training programmes.

Module 5: Methods of Community Based Disaster Management

Principles and methods of community-based approaches for urban disaster management. Community based disaster management practice. Role of self-help communities and case studies of public participation in rehabilitation projects.

Outcomes:

Understanding of the concept of disaster management in urban areas from early warning to assessment and recovery and reconstruction.
Awareness of various strategies for disaster mitigation, vulnerability reduction, hazard analysis and latest technologies in disaster risk reduction.

References:

1. Arnold, C and Reitherman, R. Building Configuration and Seismic Design. John Wiley and Sons, New York, 1982.
2. Carter, WN. Disaster Management: A Disaster Manager's Handbook, Asian Development Bank, Manila, 1990.
3. Farrington, K. Natural Disasters – The Terrifying forces of nature, Grammery Books, London, 1999.
4. Sharma, VK. Disaster Management, Rawat Publications, Jaipur, 1995.
5. United Nations. Disaster Prevention and Mitigation, United Nations Disaster Relief Organization, 1986.
6. Valdiya K S , Geology, environment and society.
7. Sadhu Autochs Johnston, Guide to Greening Cities.
8. Lara J Hansen, Climate Savvy.

24AA10005: Advanced Design Studio – I (Focus Area: Sustainability)

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
1	24AA10005	Advanced Design Studio – I	2	8	-	10	150	150	-	300

Course Objectives:

To enable the student to understand the underlying concepts of Sustainable Architecture, to experiment and utilize them in various aspects of building design.

To train the student to derive sustainable solutions at an individual building level.

Design Studio Focus:

The design studio should focus on the role of site planning, spatial design, building materials, construction technology, landscape and other components in achieving sustainability. The studio work includes both, the quantitative and qualitative analysis of buildings and the role of each of the above components in achieving sustainability. Passive design strategies are to be explored in contemporary architecture.

The studio will experiment on designing an individual building, like a residence, primary school, health center, small office, etc. situated in one of the climatic zones in India. In-depth analysis of the local climate, site conditions, usage characteristics of the premises, user-groups' functional and physiological needs, and aspirations should guide the student in deriving appropriate building geometry, orientation, blending of built, semi-open and open spaces, and usage of suitable building elements to achieve a sustainable building design solution.

Presentations & Viva Voce:

Stage-wise progress of student's approach to design is continually evaluated by the studio faculty at various internal juries, followed by a final presentation at the semester-end design jury.

Viva-voce on the project would be conducted by an external jury to examine the prudence of the student in deriving the design solution, reviewing the complete work done during the design studio.

References:

1. Mitchell Joachim, New Directions in Ecological Design.
2. Joseph Louis Mateo, Global Housing Projects.
3. Suzlon, Sustainability: one earth.
4. Linton, Harold, Urban Reflections: Illustrated World cities.
5. James Mary O'Connor, Architecture and Passive Design.

DETAILED SYLLABUS
SECOND SEMESTER

24AA20001: Contemporary Processes in Architectural Design: BIM, AI, ML, VR, AR

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
2	24AA20001	Contemporary Processes in Architectural Design: BIM, AI, ML, VR, AR	2	-	-	2	50	-	100	150

Objectives:

To provide an overview of various contemporary design processes and its relation to computation.
To investigate the contemporary theories of media and their influence on the perception of space and architecture.

Module 1: Introduction to Contemporary Processes in Architectural Design

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

Module 2: Aspect 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.

Module 3: Contemporary Process

Overview of various Contemporary design process and its 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.

Module 4: Geometries and Surfaces

Fractal Geometry and their properties. Architectural applications - works of Zvi Hecker etc. Shape Grammar - Shapes, rules and Label. Shape Grammar as analytical and synthetic tools. Combining Shape grammar and Genetic algorithm to optimize architectural solutions. Introduction to Hyper surface and concepts of Liquid architecture.

Module 5: Case Studies

Case studies- study, understanding and analysis of known examples at the national and international level 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.

Outcomes:

Understanding of the effect of contemporary theories of media on contemporary architectural design.
Understanding of various contemporary design process and their relation to computation

References:

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

24AA20002: Theory & Application of Digital Architecture

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
2	24AA20002	Theory & Application of Digital Architecture	1	-	2	3	50	-	100	150

Course Objectives:
To create a discussion on issues of Architectural Interpretations in the contexts of culture and socio-economics with a backdrop of emerging Computer Technology.

Module 1: Introduction to Architectural Interpretations
Architectural Interpretations in the contexts of culture and socio-economics.
Module 2: Emerging Computer Technologies
Influenced of emerging computer technologies on architecture and all building industry. Digital design processes and digital manufacture possibilities.
Module 3: Changing Cultures of The World Due to Technological Innovations
Forces which contribute to the cultural change described include colonization, globalization, and advances in communication, transport and infrastructure improvements.
Module 4: Architectural Interpretations
Rethinking Architecture Architectural Interpretations in the contexts of globalization. Super Modernism. Complexity Science and its influence on Architecture and Culture.
Module 5: Other Theoretical Issues
Theories of globalization local contexts

References:

1. Rethinking Architecture: A Reader in Cultural Theory by Neil Leach
2. Architecture Culture: 1943-1968 (Columbia Books of Architecture) by Joan Ockman
3. Architecture Theory since 1968 by K. Michael Hays (Editor)
4. Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory 1965-1995 by Kate Nesbitt
5. The Poetics of Construction in Nineteenth and Twentieth Century Architecture by Kenneth Frampton
6. Complexity and Contradiction in Architecture by Robert Venturi
7. Architecture, Technique and Representation (Critical Voices in Art, Theory, and Culture) by Stan Allen
8. The Paradox of Contemporary Architecture by Peter Cook (Editor), et al
9. Ten Books on Architecture by Vitruvius, et al
10. The Architecture of the Jumping Universe: A Polemic: How Complexity Science Is Changing Architecture and Culture by Charles Jencks
11. Ontology of Construction: On Nihilism of Technology and Theories of Modern Architecture by Kenneth Frampton (Foreword), Gevork Hartoonian (Paperback - March 28, 1997)
12. Chora Four: Intervals in the Philosophy of Architecture by Alberto Perez-Gomez (Editor), Stephen Parcell (Editor)

23MAA2003: Advanced Design Visualization Studio

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
2	24AA20003	Advanced Design Visualization Studio	1	-	2	3	50	100	-	150

Course Objectives:

Specific issues dealing with form generation using the generative potential of software's unique ability to deploy geometric entities. Introduction of Shape grammars, 3D sketch boards, parametric design tools, virtual environments etc. Discussion of Visualization techniques and their potential uses for the Architectural Design and analysis.

Module 1: Introduction to Architectural Visualization

Introduction to Virtual environments, Alpha worlds, Digital design in Architecture & Design. Introduction to Hardware components such as data-gloves, Head Mounted Displays, IMAX screens, AR & VR Goggles.

Module 2: Shape Grammar

Shape grammars for form generation: Visual and spatial reasoning in Design.

Introduction of features found in typical 2D & 3D shape grammars. References used in conjunction with tabular shape grammar summaries such as those for DXF, IGES, RIB, and VRML-Digital tectonics, Morphogenetic design strategies, Reflexive architecture, Hybrid Spaces-Other related issues: Contemporary Digital Experimentation and the Radical Avant-garde.

Module 3: Presentations & Viva Voce

Stage-wise progress of student's approach to design is continually evaluated by the studio faculty at various internal juries, followed by a final presentation at the semester-end design jury. Viva-voce on the project would be conducted by an external jury to examine the prudence of the student in deriving the design solution, reviewing the complete work done during the design studio.

References:

1. Hyper Architecture: Spaces in the Electronic Age (The Information Technology Revolution in Architecture) by Luigi Prestinenza Puglisi, L. Byatt (Translator)
2. Next Generation Architecture: Folds, Blobs, and Boxes by JOSEPH ROSA
3. Advanced Technologies: Building in the Computer Age (The Information Technology Revolution in Architecture) by Valerio Travi.
4. Hyperbodies by Kas Oosterhuis
5. Digital Tectonics by Neil Leach (Editor), David Turnbull (Editor), Chris Williams (Editor)
6. Hybrid Space: Generative Form and Digital Architecture by PETER ZELLNER
7. Developing Digital Architecture by Yu-Tung Liu (Editor), Yu Tung Liu
8. Architectural Representation Handbook: Traditional and Digital Techniques for Graphic Communication by Paul Laseau.

24AA20004: Advanced Design Optimization Through Algorithms

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
2	24AA20004	Advanced Design Optimization through Algorithms	1	-	2	3	50	-	100	150

Course Objectives:

To introduce students to the concepts and techniques of modern optimization theory and practice.
To learn and analyze how design optimization enhances the design outcome.

Module 1: Introduction

Optimization and evolutionary design. Optimization in the design process. Overview of principles, methods and tools for design optimization.

Module 2: Optimization Method

Evolutionary Design Optimization using Genetic Algorithms. Overview of traditional gradient-based methods.

Module 3: Fundamental Concepts of Optimality

Formulation of the objective function for architectural design. Aggregating multiple objectives and multi-objective optimization. Constraint handling.

Module 4: Design Optimization Practice

Case Studies by students on Design Optimization in practice.

Module 5: Modeling

Selection of design variables, objectives and constraints. Building optimization models. Post-Optimal Analysis.

Outcomes:

Learning of the fundamentals of optimization and its support in the design process.
Creation of an appropriate simulation model of the design problem to formulate the optimization problem and use algorithmic optimization techniques and computer support tools to solve the problem.

References:

1. John S.Gero (ed), *Design Optimization*, Academic press, Inc, 1985
2. Antony D.Radford and John S.Gero , *Design by Optimization in Architecture, Building, and Construction,* Van Nostrand Reinhold, 1988
3. Panos Y. Papalambros and Douglass J. Wilde, *Principles of Optimal Design – Modeling and Computation*, Cambridge University Press, 2000
4. Mitsuo Gen and Runwei Cheng, *Genetic Algorithms and Engineering Optimization*, Wiley, 2000

24AA2ELC1: Elective III (Option 1): High End 3d Modeling

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
2	24AA2ELC1	High End 3d Modeling	-	-	2	2	50	50	-	100

Course Objectives:

To comprehend and prepare digital design solution using advance high-end modeling and animation.
To train students on the high end-3D modeling and animation.
To introduce students to a suitable 3D modeling software such as MAYA
To introduce students to Hypergraph Modeling: Nurb Modeling/ Polygon Modeling / Organic Modeling
To introduce students to animation - working with Key frames and Breakdowns/ Deformers/ Character setup/Rendering:
To introduce students to advanced effects of lighting/shading/texture advanced effects and MEL scripting language.

Module 1: Fundamentals of 3D Modeling in Architecture

Understanding the principles of 3D space. Overview of various 3D modeling software (e.g., Autodesk Revit, Rhino, SketchUp). Basic modeling techniques: extrusion, lofting, sweeping, and Boolean operations. Advanced techniques for precise modeling. Mastering parametric modeling.
Exploring advanced editing tools and modifiers. Introduction to rendering engines and materials. Lighting techniques for realistic visualizations. Post-processing and compositing for high-quality renders.

Module 2: Advanced Parametric Design in Architecture

Understanding parametric design principles. Exploring parametric tools in software (e.g., Grasshopper for Rhino). Building parametric relationships and algorithms. Using parametric modeling for generative design. Optimization techniques for performance-based design. Case studies of parametric design in real-world architectural projects. Applying parametric principles to detailing. Parametric patterns and ornamentation. Integrating parametric models with digital fabrication techniques.

Module 3: Advanced Texturing and Materiality

Understanding material properties and textures. Creating custom materials and textures. Mapping techniques for realistic material representation. Introduction to procedural texturing. Hands-on experience with Substance Designer. Applying procedural textures to architectural elements. Advanced material rendering techniques.
Realistic representation of various materials (e.g., glass, metal, concrete). Texture mapping for architectural visualization.

Module 4: Animation and Simulation in Architectural 3D Modeling

Introduction to animation principles. Creating basic walkthroughs and flyovers. Keyframing and camera animation. Simulating environmental factors (e.g., sunlight, wind). Analyzing daylighting and shadow studies. Using simulation tools for performance analysis. Creating cinematic architectural animations. Introduction to VR for architectural walkthroughs. Integrating animation and simulation for immersive experiences.

Module 5: Project Integration and Capstone

Application of 3D modeling skills to a real-world architectural project. Project development from conceptualization to final visualization. Presentation and critique of capstone projects.

Outcomes:

Identification of the basic elements in the process of creating a 3D scene and construction of 3D models using well proven techniques.

References:

1. User's Manual for MAYA, Alias Wavefront.
2. Perry Hrovas, et.al, MAYA Complete 2, BPB Publications New Delhi, 2000.

24AA2ELC2: Elective III (Option 2): Smart Materials

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
2	24AA2ELC2	Smart Materials	1	-	1	2	50	50	-	100

Course Objectives:

To introduce students to smart materials for use in architectural design
To examine, in depth, materials and technologies such as LED's, smart glazing, displays and interactive surfaces and their contemporary application in architecture.
To discuss the methods of fabrication, production and construction for innovation in design.

Module 1: Introduction

Introduction to Innovative Materials. Smart materials in Nature. Current Trends and Developments.

Module 2: Property Changing Smart Materials

Photochromics. Thermochromics. Electrochromics. Photoadhesives. Electroactive Polymers. Shape Memory Alloys. Phase change Materials (PCM) - Photoluminescents – Photovoltaics, LED's, Photoelectric-thermoelectric, Piezoelectric.

Module 3: Matter-Exchanging Smart Materials

Gas/Water storing Smart Materials. Absorbent/Super absorbent Polymers - Bioplastics

Module 4: Case Studies

Case studies by students on the innovative applications of Smart Materials in Design.

Outcomes:

Learning of the fundamentals of material and comprehensively analyze current applications in architecture.
Exploration of the potential of smart materials in creative designing.
Understanding of smart material characteristics and methods of material technology transfer to design, thereby inventing innovative approaches to design.

References:

1. Michelle Addington and Daniel L. Schodek, *Smart Materials and Technologies in Architecture*, Architectural Press, Elsevier, 2004
2. Axel Ritter, *Smart Materials: In Architecture, Interior Architecture and Design*, Birkhauser 2007
3. Marinella Ferrara and Murat Bengisu, *Materials that Change Color: Smart Materials Intelligent Design*, Springer, 2013
4. Elena Gorb, Yves.J.M.Brechet et al, *Materials Design Inspired by Nature: Function Through Inner Architecture (RSC Smart Materials)*, RSC Publishing, 2013

24AA2ELD1: ELECTIVE IV (Option 1): Advanced Biomimetic Architecture

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
2	24AA2ELD1	Advanced Biomimetic Architecture	2	-	-	2	50	50	-	100

Course Objectives:

Understand the fundamental principles of biomimicry and its relevance to architecture.
Explore historical and contemporary examples of biomimetic design in architecture.
Develop an awareness of the ecological and sustainable benefits of biomimicry in the built environment.

Module 1: Introduction to Biomimicry and Architectural Relevance

Define biomimicry and its applications in architecture.
Understand the historical context of biomimetic design.
Explore the ecological and sustainable benefits of biomimicry in architecture.

Module 2: Biomimetic Design Principles and Methodologies

Explore biomimetic design methodologies and processes.
Introduce tools and techniques for analyzing biological systems and translating them into architectural solutions.
Foster interdisciplinary collaboration and communication in biomimetic design.

Module 3: Biomimicry in Architectural Design - Case Studies

Analyze and critique real-world examples of biomimetic design in architecture.
Understand the challenges and opportunities of implementing biomimicry in different architectural contexts.
Develop critical thinking skills in evaluating the success and limitations of biomimetic solutions.

Module 4: Advanced Biomimetic Design Techniques and Technologies

Explore cutting-edge developments in biomimetic design and emerging technologies.
Investigate the role of biomimicry in addressing complex challenges, such as climate change and urbanization.
Encourage students to propose and develop their biomimetic design projects.

Module 5: Future Trends and Applications of Biomimicry in Architecture

Explore emerging trends and future applications of biomimicry in architecture.
Discuss the ethical considerations and cultural implications of biomimetic design.
Encourage critical thinking about the role of biomimicry in shaping the future of architecture.

Course Outcomes:

Students will be familiar with the latest advancements and potential future applications of biomimetic design.
Students will critically analyze the ethical and cultural dimensions of biomimetic architecture.
Students will formulate informed opinions on the role of biomimicry in the future of architectural practice.

References:

1. Benyus, J. M. (1997). "Biomimicry: Innovation Inspired by Nature."
2. Pawlyn, M. (2011). "Biomimicry in Architecture."
3. Speck, T., Speck, O., & Horn, R. (2013). "Biomimetic Research for Architecture and Building Construction."
4. Timothy Beatly, Handbook of Biophilic City planning and design.
5. Aymara R Arreaza, Ecological Inspirations.
6. Architecture Boogazine, Natures: Verb.

24AA2ELD2: ELECTIVE IV (Option 2): Digital Fabrication

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
2	24AA2ELD2	Digital Fabrication	-	-	2	2	50	50	-	100

Course Objectives:

To gain an understanding of systems application of existing modes of production using digital fabrication.

To develop a new thinking that results from invented systems in which design is constrained and informed by CAD/CAM manufacturing and real materials.

Module 1: Manufacturing Processes

Different manufacturing processes like Additive, Subtractive & Consolidatory processes such as CNC cutting, CNC milling, Laser Cutting, 3D Printing (SLS & FDM), 3D Scanning, 3 Axis CNC cutting & milling on non-planar surfaces.

Module 2: Sessional Work

Data conversion for design production will be emphasized upon details for file Conversions, Meshing, etc. that is required for realizing the proto-types from digital files of the models will be emphasized upon.

Students will be exposed to emerging theories pertaining to smart materials and alloys.

Students will demonstrate their proficiency through Model making Students will submit reports related to their process of fabrication and research in the related domain will be presented through documentation.

REFERENCES:

1. Lisa Iwamoto; Digital Fabrications: Architectural and Material Techniques.
2. Luca Caneparo; Digital Fabrication in Architecture, Engineering and Construction.
3. Christopher Breorkram ; Material Strategies in Digital Fabrication.
4. Sophia Vyozviti; Soft Shells: Porous and Deployable Architectural Screens.
5. Sophia Vyozviti; Folding Architecture.
6. Mark Burry Jordi Boneti Armengol, Jos Tomlow, Antoni Gaudi; Gaudi: Unseen.

24AA20005: Advanced Design Studio– II (FOCUS ON DIGITAL ARCHITECTURE)

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
2	24AA20005	Advanced Design Studio - II	2	8	-	10	150	150	-	300

Course Objectives:

To gain an understanding of various contemporary processes and translating them into architecture.
To compute the methods of quantifying architecture and developing design from codified data.

Design Studio Focus:

The project involves in developing design prototype to explore various contemporary processes and ideas using shape grammar, fractal, parametric models, and biometric etc. using major software used in design and video making.

Presentations & Viva Voce:

Stage-wise progress of student's approach to design is continually evaluated by the studio faculty at various internal juries, followed by a final presentation at the semester-end design jury.
Viva-voce on the project would be conducted by an external jury to examine the prudence of the student in deriving the design solution, reviewing the complete work done during the design studio.

Outcome:

Development of the aptitude to use Digital Media as a medium to generate complex forms.

References:

1. H. A Simon. Sciences of the Artificial, MIT Press, Cambridge, 1996.
2. B. Colajanni and G. Pelliteri (ed.), Multimedia and Architectural Disciplines, Italy, 1996.
3. M.L. Maher, et. al, Understanding Virtual Design Studios, Verlag, London 1999.
4. Robin Baker, Designing the future: The Computer Transformation of Reality, London), 1993.

DETAILED SYLLABUS

SEMESTER 3

24AA30001: Advanced Building Systems Integration

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
3	24AA30001	Advanced Building Systems Integration	2	-	-	2	50	-	100	150

Course Objectives:

Introduce the principles of building systems integration in architecture.
Explore the relationships and interactions between various building systems.
Understand the impact of integrated building systems on energy efficiency and sustainability.

Module 1: Advanced HVAC Systems Integration

Dive into advanced HVAC (Heating, Ventilation, and Air Conditioning) systems and their integration in architectural design.
Explore energy-efficient HVAC technologies and their impact on indoor environmental quality.
Introduce the concept of smart and responsive HVAC systems for sustainable building design.

Module 2: Integrated Building Automation Systems

Explore the role of building automation systems in creating a cohesive and responsive building environment.
Introduce the integration of lighting, security, and other systems through building automation.
Understand the impact of smart technologies on user comfort and energy efficiency.

Module 3: Sustainable Energy Systems Integration

Examine sustainable energy systems and their integration into architectural design.
Explore renewable energy sources and their applications in buildings.
Understand the principles of net-zero energy and energy-positive building design.

Module 4: Case Studies in Building Systems Integration

Analyze and critique real-world examples of advanced building systems integration.
Understand the challenges and opportunities of implementing integrated building systems in different architectural contexts.
Develop critical thinking skills in evaluating the success and limitations of integrated building solutions.

Course Outcomes:

Students will grasp the foundational concepts of building systems integration.
Students will identify key building systems and their roles in integration.
Students will evaluate the environmental implications of integrated building systems.
Students will critically evaluate integrated building systems in existing architectural projects.
Students will gain insights into the adaptation of integrated systems to various architectural typologies.
Students will propose modifications and improvements to existing integrated building designs.

References:

1. Allen, E., & Iano, J. (2014). "Fundamentals of Building Construction: Materials and Methods."
2. Grondzik, W., Kwok, A. G., & Stein, B. (2014). "Mechanical and Electrical Equipment for Buildings."
3. DeKay, M., & Brown, G. Z. (2017). "Sun, Wind & Light: Architectural Design Strategies."
4. ASHRAE Handbook - HVAC Systems and Equipment.
5. Coad, W. J. (2016). "Heating, Cooling, Lighting: Sustainable Design Methods for Architects."

Mumovic, D., & Santamouris, M. (2009). "A Handbook of Sustainable Building Design and Engineering: An Integrated Approach to Energy, Health, and Operational Performance."
Szokolay, S. V. (2004). "Introduction to Architectural Science: The Basis of Sustainable Design."
Duffie, J. A., & Beckman, W. A. (2013). "Solar Engineering of Thermal Processes."
Hestnes, A. G., & Gustavsen, A. (2011). "Sustainable School Architecture: Design for Elementary and Secondary Schools."
Lechner, N. (2009). "Heating, Cooling, and Lighting: Sustainable Design Methods for Architects."
Mahdavi, A., & Mathew, P. A. (2013). "The Greening of Architecture: A Critical History and Survey of Contemporary Sustainable Architecture and Urban Design."
Poirazis, H. (2019). "BIM for Building Owners and Developers: Making a Business Case for Using BIM on Projects."
Lindeburg, Michael R, Environmental Engineering reference manual for the PE exam.

24AA30002: Advanced Construction Management & Technology

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
3	24AA30002	Advanced Construction Management & Technology	2	-	1	3	50	-	100	150

Course Objectives:

- Introduce the principles and processes of construction management.
- Explore project planning, scheduling, and budgeting techniques.
- Understand risk management and quality control in construction projects.

Module 1: Advanced Construction Technologies

Explore the latest advancements in construction technologies.
Introduce Building Information Modeling (BIM) and its applications in construction.
Understand the integration of robotics, automation, and 3D printing in the construction industry.

Module 2: Sustainable Construction Practices

Explore sustainable construction practices and green building certifications.
Introduce life cycle assessment and environmental impact analysis in construction.
Understand the integration of renewable energy systems in construction projects.

Module 3: Advanced Project Delivery Methods

Explore various project delivery methods in construction.
Introduce Integrated Project Delivery (IPD) and Design-Build approaches.
Understand the legal and contractual aspects of construction projects.

Module 4: Advanced Construction Technology and Built Environment

Explore the role of construction technology in shaping smart cities.
Introduce the concept of smart infrastructure and intelligent construction systems.
Understand the integration of data analytics and sensors in construction management.

Course Outcomes:

- Students will comprehend the foundational concepts of construction management.
- Students will apply project planning and scheduling techniques to hypothetical scenarios.
- Students will analyze case studies to understand risk management and quality control in construction.
- Students will be familiar with cutting-edge construction technologies.
- Students will apply BIM principles to model construction projects.
- Students will analyze the benefits and challenges of integrating robotics and automation in construction.

References:

1. Oberlender, G. D. (2014). "Project Management for Engineering and Construction."
2. AbouRizk, S. M., & Halpin, D. W. (2017). "Project Management for Construction."
3. Schexnayder, C., Mayo, V., & Benamati, J. (2014). "Construction Project Scheduling and Control."
4. Eastman, C., Teicholz, P., Sacks, R., & Liston, K. (2018). "BIM Handbook: A Guide to Building Information Modeling."
5. Flemming, U., & Pishdad-Bozorgi, P. (2017). "Computational Design Thinking: Computation Design Thinking."
6. Kamat, V. R., Martinez, J. C., & Issa, R. R. A. (Eds.). (2020). "Building Information Modeling: Applications and Practices."
7. Kibert, C. J. (2016). "Sustainable Construction: Green Building Design and Delivery."
8. Thumann, A., & Szokolay, S. V. (2013). "Sustainable HVAC Systems: An Overview."
9. Pacheco-Torgal, F., Labrincha, J. A., Diamanti, M. V., de Brito, J., & Yu, C. P. (2018). "Eco-efficient Construction and Building Materials."
10. Lee, J., Arditi, D., & Polat, G. (Eds.). (2018). "Smart and Sustainable Planning for Cities and Regions: Results of SSPCR 2017."
11. Chen, Y., Zhang, W., Hong, J., & Wang, X. (2020). "Building Information Modeling: Technological Foundations and Industry Practices."
12. El-Diraby, T., & Nayeri, P. (2015). "Smart Cities: Foundations, Principles, and Applications."
13. Building Information Modeling: Technological Foundations and Industry Practices."

24AA30003: High Performance Building Envelopes

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
3	24AA30003	High Performance Building Envelopes	2	-	1	3	50	-	100	150

Course Objectives:

Explore the key components of building envelopes, including walls, roofs, and fenestration.
Understand the impact of building envelopes on energy efficiency, occupant comfort, and sustainability.

Module 1: Introduction to High Performance Building Envelopes

Define high-performance building envelopes and their significance in the built environment.
Explore advanced materials used in high-performance building envelopes.
Introduce technologies for thermal insulation, moisture management, and air barrier systems.
Understand the role of smart materials and innovative technologies in enhancing building envelope performance.

Module 2: Energy Efficiency and Thermal Performance of Building Envelopes

Examine the principles of energy-efficient building envelope design.
Introduce methods for evaluating and improving thermal performance.
Understand the role of passive design strategies in enhancing energy efficiency.

Module 3: Daylighting and Ventilation Strategies in Building Envelopes

Explore strategies for incorporating daylight into building design.
Examine natural ventilation and passive cooling techniques.
Understand the integration of daylighting and ventilation in high-performance building envelopes.

Module 4: Case Studies in High-Performance Building Envelopes

Analyze and critique real-world examples of high-performance building envelopes.
Understand the challenges and opportunities in implementing advanced building envelope designs.
Develop critical thinking skills in evaluating the success and limitations of high-performance building solutions.

Module 5: Future Trends and Innovations in Building Envelopes

Explore emerging trends and innovations in high-performance building envelopes.
Discuss the role of technology and research in advancing building envelope design.
Encourage students to propose and develop their ideas for future high-performance building envelope solutions.

Course Outcomes:

Students will understand the principles of energy-efficient building envelope design.
Students will assess and propose improvements to the thermal performance of building envelopes.
Students will analyze the impact of passive design strategies on building energy consumption.
Students will comprehend strategies for effective daylighting in building design.
Students will analyze natural ventilation and passive cooling methods.
Students will integrate daylighting and ventilation strategies into high-performance building envelope design.

References:

1. Straube, J. (2015). "High Performance Enclosures: Design Guide for Institutional, Commercial and Industrial Buildings."

2. Allen, E., & Iano, J. (2014). "Fundamentals of Building Construction: Materials and Methods."
3. Reinhart, C. F., & Walkenhorst, O. (2018). "Building Performance Analysis."
4. Memari, A. M., & Memari, M. (2013). "High Performance Structures and Materials III."
5. Straube, J. (2014). "High Performance Enclosures: Strategies, Guidelines, and Best Practices."
6. Kensek, K., & Noble, D. (2014). "Building Information Modeling: BIM in Current and Future Practice."
7. Osser, R. (2018). "High Performance Enclosures."
8. Bauman, F. S. (2012). "Energy-Efficient Building Systems."
9. Chappell, M. (2018). "Energy Performance of Buildings: Efficiency and Renewable Energy Sources."
10. Mardaljevic, J., & Nabil, A. (2015). "Daylighting: Natural Light in Architecture."
11. Szokolay, S. V. (2013). "Introduction to Architectural Science: The Basis of Sustainable Design."
12. Givoni, B. (1994). "Passive and Low Energy Cooling of Buildings."
13. Kensek, K., & Nobel, D. (2017). "Building Information Modeling: Planning and Managing Construction Projects with 4D CAD and Simulations."
14. Gu, L. (2019). "Green Building: Guidebook for Sustainable Architecture."
15. Straube, J. (2017). "High Performance Enclosures: Designing for Energy Efficiency and Moisture Management."
16. Carmody, John, Window systems for high-performance buildings.

24AA30004: Advanced Building Information Modeling (BIM) & Digital Design

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
3	24AA30004	Advanced Building Information Modeling (BIM) and Digital Design	1	-	2	3	50	-	100	150

Course Objectives:

Advanced BIM concepts and their significance in architectural practice.
Explore the evolution of BIM technologies and their impact on the design and construction process.
Introduce the principles of parametric modeling and scripting in BIM.

Module 1: Parametric Design and Computational BIM

Advanced parametric design techniques in BIM.
Explore computational design tools and their integration with BIM platforms.
Understand the relationship between parametric modeling and data-driven design.

Module 2: Advanced BIM Collaboration and Coordination

Explore advanced BIM collaboration tools and platforms.
Introduce clash detection and resolution techniques in BIM.
Understand the role of BIM in interdisciplinary collaboration and coordination.

Module 3: Advanced BIM Visualization and Rendering

Explore advanced visualization techniques in BIM.
Introduce rendering and animation capabilities in BIM platforms.
Understand the role of virtual reality (VR) and augmented reality (AR) in BIM.

Module 4: BIM and Sustainable Design

Examine the integration of BIM in sustainable design processes.
Explore energy analysis tools and environmental performance assessment in BIM.
Understand how BIM contributes to life cycle assessment and green building certification.

Module 5: Emerging Trends in BIM and Digital Design

Explore emerging trends and innovations in BIM and digital design.
Discuss the role of artificial intelligence (AI) and machine learning in BIM.
Encourage students to propose and develop their ideas for future BIM applications.

Course Outcomes:

- Students will understand the advanced concepts and benefits of BIM.
- Students will trace the historical development of BIM technologies.
- Students will gain exposure to parametric modeling and scripting for enhanced design capabilities.
- Students will apply parametric design techniques within BIM environments.
- Students will use computational design tools to enhance their BIM workflows.
- Students will create data-driven design solutions using advanced BIM methods.
- Students will apply BIM in sustainable design processes.
- Students will use BIM tools for energy analysis and environmental performance assessment.
- Students will understand the role of BIM in achieving green building certifications.

References:

Eastman, C., Teicholz, P., Sacks, R., & Liston, K. (2018). "BIM Handbook: A Guide to Building Information Modeling."
Krygiel, E., & Nies, B. (2014). "Green BIM: Successful Sustainable Design with Building Information Modeling."
Woodbury, R. (2010). "Elements of Parametric Design."
Terzidis, K. (2006). "Algorithmic Architecture."
Aish, R. (2013). "DesignScript: Process, Grammar, and Notation in the Age of Parametric Design."
Peters, B., & Peters, T. (2019). "Mastering Autodesk Revit 2020."
Eastman, C., Teicholz, P., Sacks, R., & Liston, K. (2018). "BIM Handbook: A Guide to Building Information Modeling."

Succar, B. (2009). "Building Information Modelling Framework: A Research and Delivery Foundation for Industry Stakeholders."
Sacks, R., Eastman, C. M., & Lee, G. (2004). "Parametric 3D Modeling in Building Construction with Examples from Precast Concrete."
Aksamija, A. (2018). "Sustainable Facades: Design Methods for High-Performance Building Envelopes."
Lee, S. H., & Lee, J. (2017). "The BIM Sustainable Design."
Wigginton, M., & Harris, M. (2019). "Sustainable Construction: Green Building Design and Delivery."

24AA3ELE1: Elective V (Option 1): Advanced Artificial Intelligence & Machine Learning In Architecture

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
3	24AA3ELE1	Advanced Artificial Intelligence & Machine Learning in Architecture	2	-	-	2	50	50	-	100

Course Objectives:

- Define the fundamentals of artificial intelligence and machine learning.
- Explore the history and evolution of AI and ML in the architectural domain.
- Understand the potential impact of AI and ML on architectural design, analysis, and decision-making.

Module 1: AI and ML Applications in Design Exploration

Explore generative design and algorithmic approaches using AI and ML.
Introduce tools and platforms for AI-driven design exploration.
Understand how AI can enhance creativity, innovation, and iterative design processes.

Module 2: Machine Learning for Building Performance Analysis

Examine the role of ML in building performance simulation and analysis.
Introduce predictive modeling for energy efficiency, daylighting, and thermal comfort.
Explore data-driven approaches to optimize building systems and environmental performance.

Module 3: AI and ML in Macro Built Environment

Explore AI and ML applications in urban design and planning.
Introduce data-driven decision-making for urban development projects.
Understand how AI can contribute to smart city initiatives and sustainable urban design.

Module 4: Ethical Considerations in AI and ML for Architects

Examine ethical considerations in the use of AI and ML in architecture.
Explore issues related to bias, transparency, and accountability.
Discuss the responsibility of architects when integrating AI and ML into design processes.

Module 5: Future Trends and Innovations in AI and ML in Architecture

Explore emerging trends and innovations in AI and ML for architecture.
Discuss the integration of AI with other technologies such as VR, AR, and robotics.
Encourage students to propose and develop their ideas for future applications of AI and ML in architecture.

Course Outcomes:

Students will grasp the basic concepts of AI and ML.
Students will identify historical and contemporary applications of AI and ML in architecture.
Students will recognize the potential benefits and challenges of integrating AI and ML into architectural processes.
Students will apply generative design principles using AI and ML tools.
Students will explore algorithmic design strategies for architectural projects.

Students will recognize the role of AI in facilitating design exploration and ideation.

References:

1. Knight, T. W. (2014). "Computational Design Thinking: Computation Design Thinking."
2. Stouffs, R., Krishnamurti, R., & Janssen, P. (Eds.). (2015). "Open Systems: Proceedings of the 18th International Conference on Computer-Aided Architectural Design Research in Asia (CAADRIA 2013)."
3. Yazar, T., & Colakoglu, B. (2016). "Artificial Intelligence in Architectural Design."
4. Woodbury, R., Aish, R., & Kilian, A. (2007). "The Cognitive Design Computing Group."
5. Celani, G., & Vaz, C. (2017). "Computational Design Methods and Technologies: Applications in CAD, CAM, and CAE Education."
6. McCallum, B., Kolarevic, B., & Duarte, J. P. (Eds.). (2012). "Digital Proceedings of the 30th Annual Conference of the Association for Computer Aided Design in Architecture (ACADIA)."
7. Augenbroe, G. (2013). "Building Performance Simulation for Design and Operation."
8. Nagy, Z., & Reinhart, C. F. (2014). "Developing a simple and efficient Radiance scalper for complex fenestration systems."
9. Yoon, Y., & Augenbroe, G. (2010). "Predictive modeling of energy use: A case study of university buildings."
10. Elisângela Vilar (Editor), Ernesto Filgueiras (Editor), Francisco Rebelo (Editor), Virtual and Augmented Reality for Architecture and Design.

24AA3ELE2: Elective V (Option 2): Virtual Reality (VR) and Augmented Reality (AR) in Architecture

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
3	24AA3ELE2	Virtual Reality (VR) and Augmented Reality (AR) in Architecture	2	-	-	2	50	50	-	100

Course objectives:

Define the fundamental concepts of Virtual Reality (VR) and Augmented Reality (AR).
Explore the historical development and evolution of VR and AR in the architectural context.
Understand the potential impact of VR and AR on architectural design, visualization, and communication.

Module 1: VR and AR Tools for Architectural Design

Introduce various VR and AR tools and platforms used in architectural design.
Provide hands-on experience with popular software and hardware for VR and AR.
Explore how VR and AR can be integrated into the design process from conceptualization to presentation.

Module 2: Immersive Architectural Visualization in VR

Explore advanced techniques for architectural visualization in VR.
Introduce principles of creating immersive and interactive VR experiences.
Understand the use of VR for design review, client presentations, and public engagement.

Module 3: AR for Site Analysis and Urban Planning

Explore the application of Augmented Reality for site analysis and urban planning.
Introduce geospatial AR tools and their integration with architectural projects.
Understand how AR can aid in visualizing and analyzing data in the context of the built environment.

Module 4: AR for Building Maintenance and Facility Management

Explore the application of AR in building maintenance and facility management.
Introduce AR tools for visualizing building systems, maintenance procedures, and facility information.
Understand how AR can contribute to the efficient operation and maintenance of buildings.

Module 5: Future Trends and Innovations in VR and AR in Architecture

Explore emerging trends and innovations in VR and AR for architecture.
Discuss the integration of VR and AR with other technologies such as AI, robotics, and IoT.
Encourage students to propose and develop their ideas for future applications of VR and AR in architecture.

Course Outcomes:

Students will comprehend the basic principles and terminology of VR and AR.
Students will identify historical and contemporary applications of VR and AR in architecture.
Students will recognize the potential benefits and challenges of integrating VR and AR into architectural processes.
Students will be familiar with a range of VR and AR tools and their capabilities.
Students will apply VR and AR tools in architectural design projects.
Students will understand the workflow of integrating VR and AR into the design process.

References:

1. Cruz-Neira, C., Sandin, D. J., & DeFanti, T. A. (1993). "Surround-Screen Projection-Based Virtual Reality: The Design and Implementation of the CAVE."
2. Schnabel, M. A., & Kvan, T. (2003). "Spatial Understanding in Immersive Virtual

Environments."
3. Wang, X. (2019). "Virtual Reality Technologies for BIM-Based Performance Visualization."
4. Bowman, D. A., Kruijff, E., LaViola, J. J., & Poupyrev, I. (2005). "3D User Interfaces: Theory and Practice."
5. Microsoft. (2020). "Introduction to Microsoft HoloLens."
6. Autodesk. (2021). "Virtual Reality in Autodesk Revit: A Step-by-Step Guide."
7. Billinghurst, M., Clark, A., & Lee, G. (2015). "A Survey of Augmented Reality."
8. Banissi, E., Burkhard, R., Grinstein, G., Stuart, L., & Wyeld, T. (2013). "Advanced Visual Interfaces for Digital Cultural Heritage."
9. Schmalstieg, D., & Hollerer, T. (2016). "Augmented Reality: Principles and Practice."
10. Kolarevic, B., & Malkawi, A. M. (2005). "Performative Architecture: Beyond Instrumentality."
11. Duarte, J. P., & Heitor, T. (2008). "Sustainable Housing Design: Learning from Vernacular Architecture."
12. Corser, R. (2016). "Augmented Reality for Site Planning and Analysis."

24AA3ELF1: Elective VI (Option 1): Technology & Human Centered Design in Architecture

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
3	24AA3ELF1	Technology & Human Centered Design in Architecture	2	-	-	2	50	50	-	100

Course Objectives:

Define the fundamental concepts of human-centered design (HCD) in architecture.
Explore the historical development and evolution of HCD principles.
Understand the importance of user experience, inclusivity, and human well-being in architectural design.

Module 1: User Research and Empathy in Architectural Design

Introduce methods of user research and empathic design in architectural practice.

Explore techniques for understanding the needs, behaviors, and preferences of diverse user groups. Apply empathic design principles to inform architectural decision-making.
Module 2: Inclusive Design and Universal Accessibility in Architecture
Explore the principles of inclusive design and universal accessibility in architecture. Examine guidelines and standards for creating spaces that cater to diverse abilities. Apply inclusive design principles to architectural projects.
Module 3: Human-Centered Design in Interior Architecture

Explore the application of human-centered design principles in interior architecture. Introduce the relationship between spatial design and user experience. Understand the role of interior architecture in supporting human well-being.
Module 4: Technology and Human-Centered Design Integration
Examine the integration of technology in human-centered design processes. Explore the use of digital tools, simulation, and virtual reality in enhancing user experiences. Understand the ethical considerations of technology use in human-centered design.
Module 5: Human-Centered Design in Sustainable Architecture
Explore the intersection of human-centered design and sustainable architecture. Examine how sustainable practices contribute to human well-being. Introduce biophilic design principles and their impact on user experiences.

Course Outcomes:

Students will grasp the basic principles and terminology of human-centered design.
Students will identify historical and contemporary examples of human-centered design in architecture.
Students will recognize the significance of prioritizing user needs and experiences in architectural practice.
Students will conduct user research to gather insights for architectural projects.
Students will develop empathy maps and personas to understand user perspectives.
Students will integrate user research findings into the design process.

References:

1. Norman, D. A. (2013). "The Design of Everyday Things."
2. Sanders, E. B. N., & Stappers, P. J. (2014). "Probes, Toolkits and Prototypes: Three Approaches to Making in Codesigning."
3. Moggridge, B. (2006). "Designing Interactions."
4. Brown, T. (2009). "Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation."
5. Kelley, D., & Kelley, T. (2013). "Creative Confidence: Unleashing the Creative Potential Within Us All."
6. Zimmerman, J., Forlizzi, J., & Evenson, S. (2007). "Research Through Design as a Method for Interaction Design Research in HCI."
7. Preiser, W. F. E., & Ostroff, E. (2001). "Universal Design Handbook."
8. Steinfeld, E., & Maisel, J. L. (2012). "Universal Design: Creating Inclusive Environments."
9. Imrie, R. (2014). "Disability and the Built Environment in a Globalised World."
10. Pile, J. F. (2007). "Interior Design."
11. Stamper, L. (2011). "The Fundamentals of Interior Design."
12. Hutton, L. A. (2018). "Human Factors in the Built Environment."
13. Martin Evans, Housing, Climate, and Comfort.
14. Jose Sarukhan, Ecosystems and Human Well Being ed.
15. David Gosling, Gordon Cullen: Visions of Urban Design.
16. Raman Vig, Architecture for wellbeing.

24AA3ELF2: Elective VI (Option 2): Design Thinking & Innovation in Architecture

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
3	24AA3ELF2	Design Thinking & Innovation in Architecture	2	-	-	2	50	50	-	100

Course Objectives:
Define the fundamental principles of design thinking. Explore the historical development and evolution of design thinking in architectural practice. Understand the role of empathy, ideation, and prototyping in the design thinking process.

Module 1: Empathy and User-Centered Design in Architecture
Explore the importance of empathy in architectural design. Introduce methods for understanding user needs and perspectives. Apply user-centered design principles to architectural projects.
Module 2: Ideation and Creativity in Architectural Design
Explore techniques for generating creative ideas in architectural design. Introduce brainstorming, mind mapping, and other ideation methods. Apply ideation techniques to solve architectural challenges.
Module 3: Prototyping and Iterative Design in Architecture
Introduce the importance of prototyping in the design process. Explore various prototyping methods and materials in architectural contexts. Apply iterative design principles to refine architectural solutions.
Module 4: Design Thinking for Sustainable Architecture
Explore the integration of design thinking and sustainability in architecture. Examine how design thinking principles can contribute to eco-friendly and socially responsible design. Apply design thinking strategies to address sustainability challenges in architectural projects.
Module 5: Future Trends and Innovations in Design Thinking for Architecture
Explore emerging trends and innovations in design thinking for architecture. Discuss the integration of design thinking with other technologies such as AI, VR, and AR. Encourage students to propose and develop their ideas for the future of design thinking in architecture.

Course Outcomes:

Students will grasp the basic principles and terminology of design thinking.
Students will identify historical and contemporary examples of design thinking in architecture.
Students will apply empathy, ideation, and prototyping techniques in architectural projects.
Students will develop empathic understanding of users in architectural contexts.
Students will apply user-centered design techniques to gather insights.
Students will integrate user needs into the design process.

References:

1. Brown, T. (2008). "Design Thinking."
2. Plattner, H., Meinel, C., & Leifer, L. (Eds.). (2011). "Design Thinking: Understand – Improve –Apply."
3. Liedtka, J., & Ogilvie, T. (2011). "Designing for Growth: A Design Thinking Toolkit for Managers."
4. Sanders, E. B. N., & Stappers, P. J. (2008). "Co-creation and the new landscapes of design."
5. Norman, D. A. (2004). "Emotional Design: Why We Love (or Hate) Everyday Things."
6. Dunne, D., & Raby, F. (2013). "Speculative Everything: Design, Fiction, and Social Dreaming."
7. Kelley, T., & Kelley, D. (2013). "Creative Confidence: Unleashing the Creative Potential Within Us All."
8. Brown, T. (2009). "Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation."
9. Plsek, P. E., & Wilson, T. (2001). "Innovation as a Learning Process: Embedding Design Thinking."
10. Schrage, M. (2000). "Serious Play: How the World's Best Companies Simulate to Innovate."
11. Buxton, B. (2007). "Sketching User Experiences: Getting the Design Right and the Right Design."
12. Cross, N., Dorst, K., & Roozenburg, N. (1992). "Research in Design Thinking."
13. Matthew Carmona, From Design Policy to Design quality.

24AA30005: Advanced Design Studio III (Focus on Advanced Processes in Architecture)

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
3	24AA30005	Advanced Design Studio - III	2	8	-	10	150	150	-	300

Course Objectives:

Familiarize students with the design studio objectives and expectations.
Develop an understanding of the site and contextual factors influencing design.

Design Studio Focus:

Conduct in-depth research on relevant precedents, cultural contexts, and environmental factors.
Develop a conceptual framework that informs the design approach.
Develop a comprehensive understanding of building systems and integration.
Address detailed design aspects and resolve technical challenges.

Presentations & Viva Voce:

Stage-wise progress of student's approach to design is continually evaluated by the studio faculty at various internal juries, followed by a final presentation at the semester-end design jury.
Viva-voce on the project would be conducted by an external jury to examine the prudence of the student in deriving the design solution, reviewing the complete work done during the design studio.

References:

1. Jeanne Gang, Negotiated Terrains.
2. Bruce Q. Lan, Architectural manual: ecology sustainable city future ed.

24AA40001: Professional Training/Exchange Programme

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
4	24AA40001	Professional Training/Exchange Programme	-	-	4	2	50	100	-	150

Course Content:

Professional training to be conducted efficiently for a period of 25 full working days with concerned office at any time after third semester as decided by the institution offering the course.

Course Outcomes:

Practical exposure to real time challenges and situations and the process of arriving at design solutions for the same.
Exposure to technical drawings.

24AA40002: Research Paper Publication & Seminar

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
4	24AA40002	Research paper Publication & Seminar	-	-	3	3	50	100	-	150

Course Objectives:

To develop the investigative skills of graduate students, through researching one of the topic areas covered in the course.

To facilitate exchange of ideas and findings in class between students and the course instructor, hence creating a motivating environment for learning.

To enable the student to undertake methodical research on a topic in architecture and to communicate it through technical writing.

Course Content:

To develop the capacity of the students to work and undertake research in a given subject relating to architecture, presenting the observations verbally and graphically, to explore and understand the essence of a design. Acknowledge, appreciate and convey the meaning of quality designs. Identify and study the working of various systems of architecture in the society. Approach, investigate and highlight the various socially relevant issues of design through seminars.

Sessional/Term Work:

Research paper shall be prepared by each student based upon the topic approved by the institute in around 5000 words, in the format specified by the university. The paper has to adhere to the plagiarism norms as given by UGC and a plagiarism report will be attached as a
part of the submission. A research seminar to be conducted internally at the end of the term which shall be mandatory for internal evaluation.

Course Outcomes:

Students at the end of the semester should be able to undertake independent research in the field of Architecture and present it in the appropriate technical formats as required.

REFERENCES:

All books/ Journals/ Magazines/ unpublished thesis related to the topic selected by the individual student.

24AA40003: Advanced Architecture Design Thesis

Semester	Course Code	Subject	Hours/Week			Credits	Marks			
			T	S	W/L		CA	University Exam		Total
								Jury	Written	
4	24AA40003	Advanced Architecture Design Thesis	-	15	-	15	250	250	-	500

Course Objectives:

To develop independent critical thinking and design/ research abilities with reference to advancements in design.
To demonstrate an ability to comprehend the nature of architectural challenge and develop pertinent solutions with the help of knowledge grasped through the course.

Course Content & Overview:

The thesis project is to be undertaken independently by each student on a topic of his/her choice, selected and approved by the faculty during the previous semester as part of course requirements of the subject Dissertation. Thrust areas of work may include architectural design, non-conventional construction systems, large span structures, hi-tech architecture, public facilities, urban design, sustainable architecture, building system design, landscape design, detailing in design, etc. The Projects can be of any scale and size (in terms of built areas or detailing) as long as the required rigor and depth

is demonstrated by the student to merit consideration as a final project. It is expected that all genre of projects (research study or design) would end with a design solution; all projects should be grounded in a research and critical enquiry. The Project development will involve the aspects of Structural Systems,
Construction Technologies, Building Services, Detailing and Materials along with Design considerations, to develop a comprehensive Project proposal.

The key stages of the thesis process are:

1. Pre – Project: Dissertation
2. Abstract and Introduction
3. Scope and Focus of Project
4. User Activity Studies
5. Case Studies
6. Formulation of Design Brief
7. Site Studies and Guidelines
8. Conceptual Development
9. Final Design Solution

Learning Outcomes:

Research Competence:
Ability to formulate a comprehensive research question or hypothesis relevant to advanced architectural design.
Proficiency in conducting a thorough literature review and contextual analysis to inform the design process.
Critical Thinking and Analysis:
Demonstrate critical thinking skills in evaluating and synthesizing diverse sources of information.
Analyze precedents, theories, and relevant case studies to inform design decisions.
Design Innovation:
Develop innovative and creative design solutions that push the boundaries of traditional architectural thinking.
Integrate cutting-edge technologies, materials, or sustainable strategies into the design process.
Interdisciplinary Integration:
Ability to integrate knowledge from diverse disciplines, incorporating elements of technology, engineering, environmental science, or other relevant fields into architectural design.
Communication Skills:
Effectively communicate complex design ideas through various mediums, including drawings, models,

and digital representations.
Clearly articulate the theoretical framework, design intent, and rationale behind design decisions.

Collaboration and Professionalism:

Collaborate with peers, advisors, and potential stakeholders to refine and strengthen the design proposal.
Demonstrate a high level of professionalism in project management, meeting deadlines, and responding to constructive feedback.

Ethical Considerations:

Consider ethical implications in architectural design, including social, cultural, and environmental responsibilities.
Incorporate principles of inclusivity, accessibility, and sustainability in the design process.

Project Deliverables:

Thesis Proposal:
A well-defined and articulated thesis proposal outlining the research question, objectives, and anticipated contributions to the field of advanced architectural design.

Literature Review:
A comprehensive literature review that establishes the theoretical framework, contextualizing the project within existing research and architectural discourse.

Contextual Analysis:
Detailed analysis of the project site, considering historical, cultural, environmental, and social factors that influence the design.

Design Development:
Progressive iterations of the design, including conceptual sketches, diagrams, and preliminary design explorations.

Final Design Presentation:
A comprehensive presentation of the final design proposal, including digital and physical models, renderings, drawings, and any other relevant visualizations.

Design Documentation:
A thorough documentation package, including construction drawings, specifications, and any necessary documentation for the implementation of the design.

Written Thesis:
A well-structured and scholarly written thesis that discusses the research question, methodology, design process, and critical analysis of the final design outcome.

Public Presentation:
A public presentation or exhibition of the thesis project, showcasing the design and research to peers, faculty, and potentially industry professionals.

Reflective Essay:
A reflective essay discussing the challenges, successes, and lessons learned during the thesis process, offering insights into personal and academic growth.

Peer Review and Feedback:
Active participation in peer reviews, critiques, and feedback sessions, demonstrating the ability to give and receive constructive criticism.

References:

All books/ Journals/ Magazines/ unpublished thesis related to the topic selected by the individual student.