MAHATMA GANDHI UNIVERSITY

KOTTAYAM

REGULATIONS

FOR

MASTER OF ARCHITECTURE

(FULL TIME- TWO YEARS)

(FROM 2019 ADMISSION 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 Landscape Architecture, M.Arch in Urban design, etc.

1.6. “Programme Co-ordinator” 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 through out the programme period to monitor progress.

1.9. “Specialization” means a discipline of the M. Arch programme like 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 course is sufficient. For SEBC (OBC) students, a 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 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 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 co-ordinator 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 highest aggregate percentage of marks up to 8th semester in their qualifying examination.

3.2.4 If 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 case. 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 Principals 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 counseling 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 iscalculated 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 STUCTURE (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/ 1curriculum 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.

i. 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 the 65% of attendance in each of the courses.

ii. 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.

iii. 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 case.

11.5. A student can repeat a semester only once in the entire duration of study, on 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 particularspecialization 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 UniversityExamination [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 AssistantChief 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, Centres 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 centre has to ensure the smooth conduct of examinations. It is the joint-responsibility of the chief superintendent and the observer to:

i. Verify the sealing on the packets containing question papers, prior to the commencement of each examination.
ii. Note the serial numbers / code of the answer books and additional sheets supplied on each day/ examination.
iii. Ensure that sufficient numbers of invigilators are deployed in each examination hall.
iv. Visit the examination halls during examination to ensure proper invigilation by the invigilators.

v. Report malpractices / irregularities / insufficiencies if any, through proper channel.

vi. Verify the number of answer books with the attendance statement, for each examination.

vii. Ensure that the bundles of the answer scripts are properly sealed and signed immediately after the examination.

viii. 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 centre 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:

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 chose a topic of interest for dissertation and shall carry out an 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 chose a topic of interest for Thesis, preferably related to the dissertation work 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.

16.3. 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.

16.4. 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.

16.5. 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.

16.6. 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 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 purpose.

17.13. A temporary break of study/ course repeated student who is appearing first time 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 purpose.

17.14. A student absent in the first eligible chance / failed in the first appearance in the University examination and subsequently appearing for the University examination in next chance within six consecutive semesters after the commencement of his/her study, is considered as 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 17.16.1 above shall have to pass in all the courses of the semester examination as per Regulation clause 17.16.2 above, before he is declared to have passed in that semester examination in full.

18. TEACHING ASSISTANCESHIP

Teaching assistance of three hours per week shall be assigned to the 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 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 rejoin 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 rejoin 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 courses shall be shown in the prescribed scheme and syllabi. Each course shall have an integer number of credits, which reflects its weightage.

21.2Grading

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 registered. 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 candidate 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 candidate shall also be issued a consolidated statement 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

LANDSCAPE ARCHITECTURE

(FROM 2019 ADMISSION ONWARDS)

MASTER OF ARCHITECTURE: LANDSCAPE 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 duration of two years. The course structure consists **of Studio Courses, Core Courses, Electives, Professional Training, Dissertation and Thesis.**

2.2. All courses of the M. Arch Degree Course in Landscape 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 Post Graduate Degree in Landscape Architecture or a practicing Landscape Architect, 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: Research Methodology and Dissertation

Group IV: Landscape 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	
Group IV	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. Landscape Design I,II & III and Landscape Engineering I & II

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:

a. Final Jury portfolio and model evaluation.

b. Final Jury Viva voce.

3.1.4. 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 landscape architect and possess a minimum of five years teaching/practical experience after Post Graduation in 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:

a. For Landscape Design I, II & III

- Landscape Design Portfolio – 90%
- Viva Voce – 10%

b. For Landscape Engineering I & II,

- Landscape Engineering Portfolio – 80%
- Viva Voce – 20%

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 revaluated 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 astudent 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. Remote Sensing, Land Information Systems and GIS

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 II, 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. The course culminates with a workshop, undertaken by the students, for a period of one week with nurseries, specific agencies, organisations etc. with prior approval from Programme Coordinator. Alternatively workshop may be conducted in the Institution also. By the end of the semester students need to come up with a report on the work they have undertaken in the particular semester, including a report on the workshop.

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. Landscape Appreciation

4.3.1. During Semester II,the students shall select a case study as approved by the course- in charge, specified in the course plan. The case study may be a designed landscape project or a natural landscape, or both and the students shall do a critical appraisal of the same. Monthly seminars shall be conducted and evaluated by the course in charge for CA, as per the course plan. For the final jury, the students shall submit a detailed report and present the same as a seminar.

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

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

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

4.3.5. 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.

4.3.6. 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.

4.3.7. The Jurors shall evaluate the report and the seminar. The split of Final Evaluation shall be as follows:

- Seminar- 50%
- Report – 40%
- Viva Voce – 10%

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

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

4.3.10. 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.

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

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

4.4. Professional Training

4.4.1. Professional Training under a practicing Landscape Architect or as a Research Associate with a Landscape Architecture Faculty, with the same specialization, is a necessary component of the Programme, which equips the student with the practical aspects/ research base, offering the required exposure to the realm of the profession and research, before he/she takes up the Thesis.

4.4.2. The training shall be under a Landscape Architect and approved by the Head of the Teaching Institution. The student shall select A Landscape Architect with good experience and reputation in the field of Landscape Architectural practice for practical training and the same should be approved by the head of the Teaching Institution in advance before the commencement of the II semester university examination.

4.4.3. The Architect/Research Associate shall possess a valid COA Registration, and shall have minimum five years of experience in the Landscape Architecture after Post Graduation.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.

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

4.4.5. 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.

4.4.6. 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 Landscape Architect or an authorized officer supervising the work in the format prescribed by the teaching institution.

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

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

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

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

4.4.11. The Final Jury evaluation of the Professional Practice shall be conducted at the end of III semester.

4.4.12. 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 documents students shall not be permitted to appear for the final evaluation.

4.4.13. 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).

4.4.14. 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.

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

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

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

4.4.18. 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.

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

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

5. GROUP II COURSES

5.1.1. The Group II Courses Include

- Semester I: Theory of Landscape Architecture-I; Plant Systematics, Processes and Horticultural Practices; Geology, Soils & Geomorphology; Hydrology and Water Management
- Semester II: Theory of Landscape Architecture-II; Plants and Design; Landscape Ecology and Ecosystem Analysis
- Semester III: Urban Landscape; Environmental Legislations and Economics; Professional Practice; Elective II (Theory: Landscape Conservation, Planning and Management; Sustainable Landscapes; Landscape Restoration)

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

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

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

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

6. GROUP III : RESEARCH METHODOLOGY AND DISSERTATION

6.1. In the third semester, the students shall chose a topic of interest for dissertation and shall carry out an 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 is to be prepared in the prescribed format given by the Teaching Institution.

6.2. Continuous Assessment shall be done by the Guide and the Course in Charge as prescribed in the Course Plan.

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

6.4. The Final Jury shall be done as jury that is planned twice during the semester; An Interim Evaluation in the middle of the semester and the Final Evaluation at the end.

6.5. The Evaluation of the Final Jury shall be based on the dissertation presentation, dissertation report and technical paper.

6.6. For the conduct of the Interim Jury and Final Jury/Supplementary 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.

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

6.8. 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.

6.9. 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 landscape architect and possess a minimum of five years teaching/practical experience after Post Graduation in same specialization.

6.10. 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.

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

- Dissertation Presentation – 30%
- Dissertation Report – 40%
- Technical Paper-30%

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

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

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

6.15. The Final Jury members shall submit the consolidated marks to the Head of the teaching institution on the last day of Jury.

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

6.17. Every student shall get their paper reviewed and send the same, for publication in a journal or for presentation in a conference.

7. GROUP IV: LANDSCAPE ARCHITECTURE THESIS

7.1. In the fourth semester, the students shall chose a topic of interest for Thesis, preferably related to the dissertation work done in the third semester, in consultation with the guide.

7.2. 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.

7.3. As far as possible 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 theguide.

7.4. Students shall obtain approval for the project of Landscape Architecture Thesis from Teaching Institution.

7.5. 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.

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

7.7. 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.

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

7.9. 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.

7.10. 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.

7.11. The External expert shall be a Landscape Architect who possess a valid COA Registration, and shall have a minimum of eight years of experience after Post graduation in Landscape Architecture.

7.12. 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.

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

7.14. 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.

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

7.16. 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.

7.17. 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.

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

7.19. 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.

7.20. 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 eight 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.

7.21. The Chairman shall visit the venues of External evaluation in all the centres 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.

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

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

CURRICULUM/ PROGRAMME STRUCTURE

FOR

MASTER OF ARCHITECTURE

(FULL TIME-TWO YEARS)

IN

LANDSCAPE ARCHITECTURE

SEMESTER I									
Course Code	**Course**	**Hrs Per Week**			**Credits**	**Marks**			**Total**
		T	**W/L**	**S**		**CA**	**UE**		
							Jury	**Written**	
19LA01001	Landscape Design I	0	0	10	10	150	150	0	300
19LA01002	Landscape Engineering-I	0	0	5	5	100	100	0	200
19LA01003	Theory of Landscape Architecture- I	2	0	0	2	50	0	100	150
19LA01004	Plant Systematics, Processes, and Horticultural Practices	2	0	0	2	50	0	100	150
19LA01005	Geology, Soils & Geomorphology	2	0	0	2	50	0	100	150
19LA01006	Hydrology and Water Management	2	0	0	2	50	0	100	150
19LA01007	Remote Sensing, Land Information Systems and GIS	0	4	0	2	50	50	0	100
	Library/ DA/TA	3							
		30			**25**	**500**	**300**	**400**	**1200**

SEMESTER II								
Course Code	**Course**	**T**	**W/L**	**S**	**Credits**	**Marks**		**Total**
						CA	**UE**	

							Jury	Written	
19LA02001	Landscape Design II	0	0	10	10	150	150	0	300
19LA02002	Landscape engineering -2	0	0	5	5	100	100	0	200
19LA02003	Theory of Landscape Architecture- II	2	0	0	2	50	0	100	150
19LA02004	Plants and Design	2	0	0	2	50	0	100	150
19LA02005	Landscape Ecology & Ecosystem Analysis	2	0	0	2	50	0	100	150
19LA02006	Elective I (Workshop)	1	2	0	2	50	50	0	100
	1. Forest Ecology and management								
	2.Water management								
	3.Advanced horticultural practices								
19LA02007	Landscape Appreciation	1	2	0	2	100	50	0	150
	Library/ DA/TA	3							
		30			**25**	**550**	**350**	**300**	**1200**

SEMESTER III

Course Code	**Course**	**T**	**W/L**	**S**	**Credits**	**Marks**			**Total**
						CA	**UE**		
							Jury	**Written**	
19LA03001	Landscape Design III	0	0	10	10	150	150	0	300
19LA03002	Research Methodology and Dissertation	2	0	3	5	100	100	0	200
19LA03003	Professional Training	0	4	0	2	50	50	0	100
19LA03004	Urban Landscape	2	0	0	2	50	0	100	150
19LA03005	Environmental legislations and Economics	2	0	0	2	50	0	100	150
19LA03006	Professional Practice	2	0	0	2	50	0	100	150
19LA03007	Elective II (Theory)	2	0	0	2	50	0	100	150
	1. Landscape								

	Conservation, Planning and Management 2. Sustainable Landscapes 3.Landscape restoration								
	Library/ DA/TA	3							
		30			**25**	**500**	**300**	**400**	**1200**

SEMESTER IV

Course Code	**Course**	**T**	**W/L**	**S**	**Credits**	**Marks**			**Total**
						CA	**UE**		
							Jury	**Written**	
19LA04001	Landscape Architecture Thesis	0	0	25	25	300	300	0	600
					25	**300**	**300**	**0**	**600**

T- Theory W/L- Workshop/Lab S- Studio

CA- Continuous evaluation UE- University Examination

Assignment of credits

For calculation of credits,

- 1 credit for 1 theory hour
- 1 credit for 2 workshop/lab hours
- 1 credit for 1 studio hour

SYLLABUS: SEMESTER I

SEMESTER 1

19LA01001: LANDSCAPE DESIGN - 1

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA01001	Landscape Design -I	0	0	10	10	150	150	0	300

COURSE OVERVIEW

* To understand the process of landscape design and to analyze landscape design elements at micro and macro level, in terms of their form, function and aesthetics, by undertaking studio projects dealing with design of outdoor spaces.

COURSE OUTCOMES

Upon completion of the course,

* Site planning process and its significance; establishing relationship between site characteristics and design requirements.
* Successful tackling of a design problem and bringing it to a schematic level of completion.

COURSE CONTENTS

1. **Major Project**

   The major project/design exercise shall be of neighbourhood level, various typologies; urban and rural experiments; children's' play areas, etc for sites up-to 2 acres. The course work shall include

- Introduction to Landscape Design Process
- Site analysis and site planning (sites up to 2 hectares)
- Landscape design proposal
- Studying elements of landscape design and its use in the design of outdoor spaces

2. **Minor Project**

   The studio work may include minor projects like introductory exercises in Art, Architecture & Landscape, design of outdoor furniture, courtyards, water- elements etc.

REFERENCES

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3. Reid G. W: (1993) From Concept to Form: In Landscape Design. John Wiley & Sons
4. Kevin Lynch & Gary Hack: (1984) Site Planning, The MIT Press
5. Starke .B and Simonds. J. O. (2013) Landscape Architecture: A Manual of Site Planning and Design. 5 editions. McGraw-Hill Professional
6. Simonds. J. O. (1961). Landscape Architecture, the Shaping of Man's Natural Environment. London: F.W. Dodge Cooperation.
7. Baker.B.H (1987) A Dictionary of Landscape Architecture, Albu : University Of New MexicoPress
8. All publications by AVA

SEMESTER I

19LA01002: LANDSCAPE ENGINEERING-I

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA01002	Landscape Engineering- I	0	0	5	5	100	100	0	200

COURSE OVERVIEW

* Understanding the technical requirements of several aspects of the landscape architect's work, tools and techniques to shape the existing land in the form of intended design etc.

COURSE OUTCOMES

Upon completion of the course,

* Site planning process and its significance; establishing relationship between site characteristics and design requirements.
* Successfully tackling of a design problem and bringing it to a schematic level of completion.

COURSE CONTENTS

- Site Survey and Appraisal; topographic surveys and their methodology, visualising landforms, Understanding contours and their characteristics, graphical representation, deriving contours by interpolation.
- Earth form Grading; symbols and annotations, existing and modified contour mapping, basic grading principles, Earthworks cut and fill processes, volume computations, grading terraces, grading of roads across/along contours, Basics of road alignment (horizontal and vertical).
- Understanding Land/environmental modifications and engineering interventions for soil conservation, erosion control, slope stabilization etc
- Surface Drainage: Site planning for efficient drainage; understanding drainage pattern and watershed area, calculation of surface runoff, determination of catchments area and

discharge rate; types of drainage systems, design of drainage elements: swales and culverts etc, sub-surface drainage planning.

- Planning, grading and drainage of sports fields.

REFERENCES

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2. Storm.S and Kurt Nathan P.E;(1985) Site Engineering for Landscape Architects, AVI Publishing Company

3. Landphair H C; (1984) Landscape architecture construction. Elsevier

4. Christensen A J; (2005) Dictionary of Landscape Architecture And Construction .McGraw-Hill

5. Thomas J. R. Hughes; Site Engineering for Landscape Architects

6. Untermann, R. (1973) Grade Easy: an introductory course in the principles and practices of grading and drainage, Landscape Architecture Foundation7. Littlewood Michael: Tree Detailing. London. Butterworth Architecture, 1988.

8. Littlewood Michael: Landscape Detailing Vol.1 Enclosure

9. Hazlett Thomas C: Land Form Designs. P D A Publication

SEMESTER I

19LA01003: THEORY OF LANDSCAPE ARCHITECTURE-I

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA01003	Theory of Landscape Architecture-I	2	0	0	2	50	0	100	150

COURSE OVERVIEW

* To equip the students with the knowledge base regarding history of landscape Architecture with the various theories that has guided the landscape design through the ages.

COURSE OUTCOMES

Upon completion of the course,

* Development of an analytical approach to the study of theory; developing an attitude towards critique and evaluation of choices for design decisions in varied contexts of space and time.
* Appreciation of scale in terms of garden, landscape and nature

COURSE CONTENTS

Module I: Perceptions of landscape

- Man and nature, and the process of transforming landscapes; Changing perceptions of man's relationship with nature in various phases of history; responses and attitudes to nature and landscape resources as a function of this perception; Landscapes of Power, Faith and Place
- An introduction to social and cultural dimensions of landscape; Theories and Landscape design: Habitat theory, Personal space, Prospect –refuge theory. Perception, Behaviour, etc.

Module II: Landscape design and gardens till the early 19th century

Chronology of landscape development, Comparative analysis of examples of landscape separated in time and space: siting, relationship to surroundings, use of landscape elements, function, scale, symbolism, etc. Illustrative range of examples from various geographic locations and periods, highlighting aspects of Form, Space and Order, Examples from Ancient Gardens – Mesopotamia, Egypt, Greece, Rome & Western Civilisation- Europe; Italy, France, England

- Ancient Gardens and its characteristics: Mesopotamia- Hanging Gardens of Mesopotamia, Egypt- Temple of Karnak, Greece- Acropolis, Rome- Tivoli gardens
- Western Civilisation: Italian Renaissance Gardens- Villa lante, Villa Medici, Tivoli Grdens; Italian Baroque Gardens- City of Versailles, Piazza of St. Peters Basilica, French Gardens- Vaux- Le- Vicomte, Palce of Versailles
- Western Civilisation: English Picturesque Gardens-William Kent(Phase 1), Rousham House; Capability Brown(Phase 2),Stowe house, Hyde Park Gardens; Humphrey Repton(Phase 3)- Sheringham Park, Norfolk

Module III: Landscape development in the East and Cross cultural Influences

- Early traditions and beliefs about landscape and environment in east and in India; Chronology of Indian Landscape development; Aryan period; Dravidian landscape (Harappa); Ancient Indian traditions – Vedic, Jainism, Buddhism(Lumbini and Sanchi)and later **Hindu movements;** Symbolic meanings and sacred value of natural landscapes; Ancient Indian traditions; siting of structures, complexes and cities; symbolic meanings and sacred value attributed to natural landscapes; traditional landscapes such as ghats, gardens, kunds, sacred groves etc. Landscape in myth and poetry.
- Transfer of concepts through Buddhism to China; Chinese landscape development, gardens of China- Imperial, Private, Monastic and Designed landscapes of public areas; Pre Buddhist Japanese landscapes, impact of China on Japanese gardens; Japanese gardens and its types- Dry/Zen/Rock Garden, Hill and Pond Garden, Tea Garden, Stroll Garden, Paradise garden, Courtyard Garden etc with typical examples; Art of Bonsai
- Nomadic culture of central Asia, advent of Islam; Middle-east: Persian traditions(Persepolis) and its far reaching influence; concept of Paradise as a garden; influence of Persian traditions towards the West and Western expression of Islam –Moorish Gardens- Spain Alhambra and General life, Granada.
- Eastern expression of Islam, Samarkhand and Mughul Gardens in India; Mughal concepts of site planning, Tomb Garden and pleasure garden; Shalimar Gardens of Srinagar and Lahore,

Gardens of Nishant Bagh, Pinjore etc, Mughal Gardens at Taj Mahal, Sikandra, Humayun's Tomb and Red Fort; Rajput Landscapes (Mandor Gardens in Jodhpur and Chittor)

- Influences and linkages across cultures and traditions, e.g Chinese tradition and the English Landscape style; Thai Gardens, Colonial landscape development in India, Mughal and English style at Rashtrapati Bhavan, New Delhi; Development of Botanical Gardens in India like Bryant Park, Kodaikanal, Botanical Gardens, Ooty etc

REFERENCES

1. Jellicoe G. and Jellicoe S;(1995).The Landscape of Man: Shaping the Environment from Prehistory to the Present Day: Thames and Hudson
2. Bill Risebero(1996), The Story of Western Architecture :
3. Pregill, Phillip and volkman, Nancy,Van Nostrand Reinhold, Landscapes in History Design and planning in the western tradition
4. Tobey, George, Elsevier and Co, History of Landscape Architecture: The relation of people to Environment
5. Turner .T (2010), Asian Gardens: History, Beliefs and Design. London and New York: Routledge
6. Turner .T (2011),European Gardens: History, Philosophy and Design. London and NewYork: Routledge
7. Rogers.E.B;(2001)Landscape Design: A Cultural and Architectural History: Harry N.Abrams
8. Waymark J,Georges T. (2000) History Of Garden Design; Thames & Hudson
9. Moore C W / Mitchell W J;(1993) Poetics of Garden; London: MIT Press

SEMESTER I

19LA01004: PLANT SYSTEMATICS, PROCESSES, AND HORTICULTURAL PRACTICES

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA01004	Plant systematics, processes, and horticultural practices	2	0	0	2	50	0	100	150

COURSE OVERVIEW

* Introduction to the characteristics of Plant materials which are an important part of soft landscape, international nomenclature used for plants and their associations in nature.
* To promote understanding of the factors that regulates the growth and characteristics of the plant material.

COURSE OUTCOMES

Upon completion of the course,

- Understanding and identification of native flora , its functions and appropriate horticultural practices

COURSE CONTENTS

Module I: Plant Systematics and Processes

- Classification of plant kingdom, Taxonomy: rules of nomenclature and identification, General study of plant morphology and anatomy to understand plant functions. Plant identification criteria: growth habits, habitat, origin, growth duration, leaf arrangement, leaf type, main flower colour, flowering period, family, genus etc ; Structural characteristics of plants, trees, shrubs and ground covers; Identification of native flora and its identification

- Plant processes, water relation, photosynthesis and respiration. Stem, root and leaf relationship, , Growth Regulators; Response to stimuli and modification; Application of Plant Physiography to sustainable landscape design such as use of CAM (Crassulacean acid metabolism) plants in Green roofs etc.
- Mineral nutrition and nutrients; Nitrogen, Phosphorus, Potassium, Calcium, Magnesium, Sulphur –Significance, Sources and Deficiency; enzymes and metabolism; growth and flowering.

Module II: Horticultural Practices

- Introduction to horticulture; classification of horticultural plants and its characteristics; Soil: formation, composition, types, texture, pH and conductivity; Garden tools and implements; Preparation of bed; Potting mixture
- Plant nutrition and supplements. Fertilizers and Manures- types, methods of applications,. Common plant pests, diseases and their control, insecticides and their application, weed control; Biofertilizers & Biopesticides ; Biological Control ; Sustainable practices in pest management and weed control.
- Advantages of organic manures and fertilizers. Composition of fertilizers – NPK content of various fertilizers. Common organic manures – bone meal, cow dung, poultry waste, oil cakes, organic mixtures and compost. Preparation of compost - aerobic and anaerobic - advantages of both; vermicompost - preparation, vermiwash.
- Irrigation methods - surface, sub, drip, spray irrigations, mist chambers- advantages and disadvantages - periodicity of irrigation, Water budgeting .

Module III- Plant Propagation

- Methods of plant propagation; Seeds - advantages and disadvantages; Vegetative propagation - advantages and disadvantages; Natural methods of vegetative propagation; Artificial methods - cutting, grafting,budding and layering; Micro-propagation; Use of growth regulators for rooting.
- Establishment and maintenance of grass, Lawn preparation by seeds, seedling and turfing, shrubs and trees with respect to ground preparation, planting and transplanting, protection of plants during and after planting.
- Physical control of plant growth: training and pruning. Bonsai - selection of plant - bonsai containers and method of bonsai formation.Maintenance methodology, maintenance economics and maintenance details for all soft landscape; Plant growing structures: green house, orchidarium, conservatory.

Note: A **Plant & Ecology Laboratory** for studies in ecology, growth characteristics, design applications, plant material and their groupings, techniques and methods of plant manipulation may be done. This lab shall be in the form of a greenhouse and a nursery.

REFERENCES:

1. Raunkier.C., the Life forms of Plants and statistical plant geography, 1934.

2. Venkateswaralu.V.A., Text book of Botany, Vol III, Guntur.

3. Lawrence.H.M., Taxonomy of vascular plants, Oxford, IBH, 1964.

4. Rao.K.N.R. and Krishnamurthy.K.N., Angiosperms, S.Viswanathan Printers and publishers.

5. Adams C R, Early M P, 2004. Principles of Horticulture. Elsevier, N. Delhi.

6. Barton West R, 1999. Practical Gardening in India. Discovery Pub. House, New Delhi.

7. Edmond J B, Senn T L, Andrews F S, Halfacre P G, 1975. Fundamentals of Horticulture (IV Edn).

TMH, New Delhi.

8. Sadhu M K, 1996. Plant Propagation. New age International publishers, N. Delhi
9. Mohammed Shaheer, Geeta Wahi Dua, Adit Pal,2013. Landscape Architecture in India: A Reader, LA, Journal of Landscape Architecture

SEMESTER I

19LA01005: GEOLOGY, SOILS AND GEOMORPHOLOGY

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA01005	Geology, Soils and Geomorphology	2	0	0	2	50	0	100	150

COURSE OBJECTIVE

* To introduce the basic concepts and theories related to Geology, Soil, geomorphology, etc and how it affects landscape design.

COURSE OUTCOMES

Upon completion of course,

* Characteristics of landforms and soils, and its effect on landscape design

COURSE CONTENTS

Module I: Geology and Geomorphology

- Geology: History of earth, earth's structure, tectonic plates, lithosphere, asthenosphere, rocks – igneous, metamorphic & sedimentary, rock cycle, minerals
- Indian geology, geologic time scale of India, Deccan Basalt volcanism, Plate tectonics, mountain building, earthquakes, volcanoes & tsunamis, glaciers of India, geothermal fields of India.
- Application of geologic principles to environmental problems e.g.: Stream restoration, hydrogeology, geotourism
- Geologic maps, Surveying: Reading Soil, topographic construction, Geodesy, hydrographic, photogrammetry & GIS maps.

- Geomorphology and Surface processes, landforms – Glacial, Aeolian, Fluvial, deformations in landforms; Types of Weathering, Landforms made by Weathering and Erosion, Landforms made by tectonic activity, Coastal Processes, Control of Geology on landforms

Module II: Soils

- Introduction to geology of the state and of India , Soil types, Soil Formation ,Classification of soils and their properties, Soil- water or soil moisture types, soil –water relationship
- Soil modifications, Problems of soils, Acid, Alkaline, Saline soils, Sulphide soils, Essential mineral nutrients of soils, Manure and Fertilizers.

MODULE III: SOIL CONSERVATION AND MANAGEMENT

- Soil conservation, type, factors, methods of conservation, prevention of soil erosion, Soil conditioning and amendment, soil mixtures and alternative to soils.
- Soil Management: Angle of repose, Soil evaluation and land-use planning, Soil conservation and erosion control, Slope stabilization, Soil fertility and plant nutrition
- Soil degradation and control due to mining, quarrying etc, remedial actions and reclamation techniques, managing difficult soils.

REFERENCES

1. Shaheer .M, Dua G.W and Pal.A .(2012) Landscape Architecture in India: a reader .India: La, Journal of Landscape Architecture
2. Harris.C.W and Dine.N.T ; (1997) Time Saver Standards For Landscape Architecture, Mcgraw –Hill International Edition, Arch. Series
3. Storm.S and Kurt Nathan P.E;(1985) Site Engineering for Landscape Architects, AVI Publishing Company
4. Edward. J. Plaster; Soil Science and Management, Cengage Learning
5. Arbogast A; (2011) Discovering Physical Geography 2nd Edition :Wiley
6. Bateman G : Ed;(2008) Encyclopedia Of World Geography: Book Sales
7. Craul T A; (2006) Soil Design Protocols For Landscape Architects And Contractors: Wiley
8. M S Krishnan ; (2006) Geology Of India And Burma;6th Edition : CBS Publishers & Distributors
9. Dr. J. A. Daji, revised by Dr. J. R. Kadam&Dr. N. D. Patil ; A text book of Soil Science; Mumbai : Media Promoters & Publishers Pvt. Ltd.,

SEMESTER I

19LA01006: HYDROLOGY AND WATER MANAGEMENT

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA01006	Hydrology and Water Management	2	0	0	2	50	0	100	150

COURSE OBJECTIVE

* To introduce the basic concepts and theories related to hydrology and how it affects landscape design.

COURSE OUTCOMES

Upon completion of course,

* Hydrology, water conservation methods &watershed management

COURSE CONTENTS

Module I- Introduction to Hydrology

- Hydrological cycle, Water resources, Precipitation- Forms and types of precipitation; Infiltration- Factors affecting infiltration; Evaporation, evapo-transpiration - Factors affecting Evaporation; Runoff- Factors affecting Runoff; Groundwater, occurrence of groundwater; Aquifers – Confines and unconfined; geologic formations as aquifers, aquifer properties, Artesian aquifer
- Precipitation, weather systems for precipitation; Characteristics of Precipitation in India and Kerala; relationship to vegetation; Runoff: hydrograph, runoff characteristics of streams, field, flow duration curve, Flew mass curve, Natural Drainage Pattern , Characteristics and management of drainage basins; Types of flow channels
- Soil water or soil moisture, Measurement of soil moisture content , Water requirement of plants, Methods of application of water to plants/crops

- Ground water management, sources of ground water pollution and its control; Floods, Development of Karst topography, Arid and semi-arid regions, Coastal Hydrogeology, Saltwater intrusions, leaching; use of saline brackish water for development. Impacts of hydrology on environment and landscape development

Module II- Water Management

- Sewage water treatment and reuse in landscape, decentralised waste water treatment systems and its incorporation into landscape
- Rain water harvesting types- storage and recharge; traditional water harvesting systems in different regions of India; conventional systems with case studies
- Storm water management practices- Detention and Retention ponds, infiltration basins, permeable paving, constructed wetlands, roof gardens, rain gardens etc.

Module III- Watershed Management

- Concept of Watershed, Watershed Management and its importance, characteristics of watershed, application of remote sensing in watershed management; Land capability classification, production systems in arable and non-arable land
- Management of arable land; Mechanical measures- Bunding, Contour bunds, Graded bunds, Diversion drain, Grasses waterways, Bench terraces, Contour ditching etc. ; Biological measures- Contour farming, Strip cropping, Vegetative barriers, Crop residue, Mulching, Mixed cropping, Hedge Rows barrier, Alley cropping etc
- Management of non-arable land; Mechanical measures- Contour trenching, Orchard terraces, Diversion drain, Stone walls; Biological measures-Half moon terraces, Geojute, Protected terraces, Retaining walls, Wattling, Crib structures, Gunny bag structures

REFERENCES:

1. Shaheer .M, Dua G.W and Pal.A; Landscape Architecture in India: a reader .India: La, Journal of Landscape Architecture, 2012
2. Harris.C.W and Dine.N.T ; Time Saver Standards For Landscape Architecture, Mcgraw – Hill International Edition, Arch. Series, 1997
3. Storm.S and Kurt Nathan P.E; Site Engineering for Landscape Architects, AVI Publishing Company, 1985
4. Bansil P.C, Water Management in India, Concept Publishing Company, 2004, pg 1- 48
5. Madan Mohan Das & Mimi Das Saikia, Watershed Management, PHI Learning Private India, 2003

SEMESTER I

19LA01007: REMOTE SENSING, LAND INFORMATION SYSTEMS AND GIS

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA01007	Remote Sensing, Land Information Systems and GIS	0	4	0	2	50	50	0	100

COURSE OVERVIEW

* To introduce the basic concepts of remote sensing and GIS software for spatial analysis.

COURSE OUTCOMES

Upon completion of the course,

* Techniques of Map preparation and analysis using maps.
* Application of GIS in Landscape Architecture..

COURSE CONTENTS

Module I: Classification of Spatial and Non-Spatial Data

- Spatial relationships among elements / activities , fundamentals of topological relationship, spatial data and their representation in maps, raster and vector based system to representing spatial objects-
- Geographical Information System – GIS software in general - over view of GIS map components.

Module II- Map Preparation and Displaying

- Basics of GIS maps preparation, digitization of spatial data, concept of point, line and polygon features
- Fundamental of coordinate system, map layers and geo-referencing, displaying spatial features, adding attribute values to the features, preparing and displaying thematic layers and maps, selecting and editing spatial features and attribute data , preparing Grid surfaces form point, line and polygon features.
- Spatial Analysis using GIS spatial joining, concept of geo processing – union, intersect, clip and merge, features to raster, preparing surfaces, creating TIN surfaces and contours, surface analysis, spatial joining of geographic features.

Module III: Applications of GIS in Landscape Architecture & Planning

- Overlaying features and analyzing using overlay function, feature selection, buffering, table joining and analysis, manipulating attribute data, classification and reclassifications, GIS modelling, 3D display.
- Introduction to landscape GIS model, Case problem on landscape analysis, suitability analysis using GIS, preparing land-use maps, landscape impact analysis using GIS, landscape suitability analysis, application of GIS in assessing Landscape Ecological risks.

REFERENCES:

1. Introductory Digital Image Processing: A Remote Sensing Perspective, John R. Jensen
2. Land use Planning And Remote Sensing, David T. Lindgren
3. Remote Sensing And Interpretation By Thomas M Lillesand And Kiefer

SYLLABUS: SEMESTER II

SEMESTER II

19LA02001: LANDSCAPE DESIGN-II

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA02001	Landscape Design II	0	0	10	10	150	150	0	300

Course Overview:

* Understanding and resolving complex issues at various scales and situations in an urban or rural fabric of residential / commercial/ institutional/ recreational/industrial land use.

Course Outcomes:

* Understanding of arriving at design solutions for larger sites and expressing the same using models

Course contents

* Site analysis, synthesis, suitability, landscape zoning and planning with landscape land uses for medium to large scale projects.
* Evolving an open space structure for the site and suggesting a suitable landscape treatment with respect to ecological, functional, cultural and visual context.
* Process for landscape project formulation and landscape design development based on synthesis
* Examines how humans occupy exterior space and combines this information with the principles of design to create garden scale models. Models are used as a medium for design expression.

References:

1. Simonds. J. O. (1961). Landscape Architecture, The Shaping of Man's Natural Environment. London: F.W. Dodge Cooperation.

2. Harris.C.W and Dine.N.T ; (1997) Time Saver Standards For Landscape Architecture, Mcgraw – Hill International Edition, Arch. Series

3. Starke .B and Simonds. J. O. (2013) Landscape Architecture: A Manual of Site Planning and Design. 5 editions. McGraw-Hill Professional

4. Baker.B.H (1987) A Dictionary of Landscape Architecture. Albu : University Of New Mexico Press

5. Reid G. W: (1987) Landscape Graphics: Watson-Guptill

6. Shaheer .M, Dua G.W and Pal.A .(2012) Landscape Architecture in India: a reader .India: La, Journal of Landscape Architecture

7. Reid G. W: (1993) From Concept to Form: In Landscape Design. John Wiley & Sons

8. All publications by Brian Hackett

SEMESTER II

19LA02002: LANDSCAPE ENGINEERING-II

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA02001	Landscape Engineering - II	0	0	5	5	100	100	0	200

COURSE OVERVIEW

* To develop an understanding of the working drawings and related documents required for the successful implementation of a project.

COURSE OUTCOMES

Upon completion of the course,

* Equip the students to do landscape working drawings and preparation of bill of quantities and estimation.

COURSE CONTENTS

- Site mobilization; Sequence of site activity, site protection measures, site implementation checklist.
- Design and detailing of hard landscapes: Roads, paving, barriers, edge conditions -functions, types, criteria for selection, design aspects, details.
- Outdoor lighting: Definition of technical terms, types of electrical lighting, types of fixtures, auxiliary fixtures. Principles of design for outdoor illumination, design and type of effects with electrical lighting. Safety precautions and drawbacks of electrical lighting, electrical accessories and their installation. Solar energy and lighting.
- Water features and Irrigation systems: Design of water features such as swimming pools, cascades, fountains etc., and their technical requirements. Consideration for design and

detail. Water bodies and natural ponds. Design of irrigation system – landscape area types, Course Overviews and design, water needs and sources, application, methods of installation. Control systems, scheduling and maintenance.

- Outdoor furniture: Criteria for the selection of materials and specifications for the street furniture in various environments. Design of signage and simple outdoor structures like pavilions, gazebos etc. Use of waste materials in landscape, recycling and reuse of materials, their impact on landscape design.
- Construction details of Terrace gardens, roofscapes, vertical landscapes, garden ornaments
- Preparation of tender documents, Bill of quantities and specifications

References

1. Harris.C.W and Dine.N.T ; (1997) Time Saver Standards For Landscape Architecture, Mcgraw – Hill International Edition, Arch. Series
2. Storm.S and Kurt Nathan P.E;(1985) Site Engineering for Landscape Architects, AVI Publishing Company
3. Landphair H C; (1984) Landscape architecture construction. Elsevier
4. Asensio C.F ;(1996) Environmental Restoration Landscape .(Arco Colour Collection):Roto Vision
5. Özyavuz.M (2013) ; Advances in Landscape Architecture. InTech
6. Weiler .S and Barth.K.S ;(2009) Green Roof Systems: A Guide to the Planning, Design and Construction of Landscapes over Structure :Wiley and Sons
7. David Sauter, Landscape Construction, Pelmer Thomson Learning, 2000.
8. Michael Little wood, Landscape Detailing Volume I -IV, Architectural Press, 1993.
9. Naoki Mukoda, Street furniture, Biju t sushuppan – sha Ltd., 1990.

SEMESTER II

19LA02003: THEORY OF LANDSCAPE ARCHITECTURE- II

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA02003	Theory of Landscape Architecture- II	2	0	0	2	50	0	100	150

COURSE OVERVIEW

- To understand the paradigms in landscape architecture in the post industrial revolution era and to understand the multifaceted dimensions of landscape architecture such as ecology, environment behaviour and sustainability.
- To study contemporary landscape and the manifestation in the western and Indian context.

COURSE OUTCOMES

Upon completion of the course,

- Contemporary landscape design projects and its multi-faceted dimensions.

COURSE CONTENTS

Module I: Industrial Revolution and open space development

- Nineteenth Century Europe: The socio-cultural impact of industrialization and urbanization; its effect on public health legislation and the development of new landscape types, public parks and facilities for sports; Open space development in its urban design and planning context; Early industrial towns , Garden City movement (Letchworth, Welwyn) and the City Beautiful Movement

- USA: Further evolution of the public park as a major component of urban landscape. The work of, F. L. Olmsted, Lawrence Halprin and other pioneers. Park-Systems and suburban development centred on open space; Major park systems like Central Park ,Prospect Park, Emerald Necklace Park, Lovejoy Fountain Park etc
- Evolution of landscape architecture in the post industrial world: Influence of Andrew Jackson Dawning, Thomas Church, Geoffrey Jellicoe, Burle Marx etc;
- Post-war development in Europe: New Towns in England and the concept of Landscape Structure; Landscape Urbanism; Examples of open space development in new towns and urban renewal to illustrate the close conceptual relationship between town planning, urban design and landscape architecture (e.g. Haussmann's Paris, Lutyen's Delhi).

Module II- Contemporary Works

- The Modern Movement: changing concepts of space and the relationship of architecture and landscape; Philosophy and selected works of the modern masters;, Dereck Lovejoy, Frederick Gibbered , Dan Kiley, Garrett Eckbo, Fletcher Stele etc
- Contemporary works of landscape architects in the west ; Tropical landscape architects- Geoffrey Bawa (Lunuganga Estate& other important works) & other major landscape architects; The Indian Context: Understanding contemporary attitudes to open space design in India:. Trends in landscape design in India in the late 20th and the first decade of the 21st Century

Module III- New Realms of Landscape Architecture

- New concept in Landscape Architecture in late 20^{th} century: Landscapes as environmental science, environmental art, land art, landscapes for recreation, landscapes for experimenting theories (Bernard Tschumi), urban landscapes (plazas and squares), regenerative landscapes (high line park) etc
- The influence of Ian McHarg on mid and late 20th Century landscape architecture; Environment and Ecology into landscape: cheonggyecheon stream restoration, works of Turenscape, and similar works; Multifunctional landscapes, Continuous Productive Urban Landscapes- urban agriculture for sustainable cities; Market gardens
- Cultural landscapes, their definition, identification, characteristics and polices; Landscape inventory and conservation of historical landscape, Landscapes- as historic preservation resource; Green pilgrimage network, Sacred landscapes. Historic Urban Landscapes.
- Artistic sensibility in Landscape Architecture, land art; new developments in urban landscape design through the works of Martha Schwartz , Charles Jencks, Nancy Holt etc

References

1. Jellicoe G. and Jellicoe S;(1995).The Landscape of Man: Shaping the Environment from

Prehistory to the Present Day: Thames and Hudson

2. McHarg, Ian L, (1969) Design with Nature, Garden City, N.Y: The Natural History Press,

3. Appleton.J;(1996),the experience of landscape: Wiley

4. Lyall S; (1992) Designing The New Landscape: Thames and Hudson

5. Brown J.(2000) The Modern Garden: Princeton Architectural Press

6. Tate A;(2001) Great City parks: Taylor & Francis

7. Siciliano P C; (2004) Landscape Interpretations: History, Techniques and Design Inspiration: Delmar Cengage Learning

8. Simon Swaffield; (2002) Theory in Landscape Architecture- A Reader; University of Pennsylvania Press

9. Tom Turner;(1996) City as Landscape- A post-modern view of Design and Planning; London :E and FN Spon.

10. Steven C. Bourassa; (1991)The Aesthetics of Landscape, London:Belhaven Press

11. Sylvia Crowe; (1958) Landscape of Power, London : The Architectural Press

SEMESTER II

19LA02004: PLANTS AND DESIGN

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA02004	Plants and Design	2	0	0	2	50	0	100	150

COURSEOVERVIEW

* To develop an understanding of the factors affecting planting design and what can be achieved through design with plants.
* To make the students understand the planting design professional/technical drawing, design placement aspects and specification standards of plant materials.

COURSE OUTCOMES

Upon completion of the course,

* Understanding the role planting and applications of planting design.
* Understanding of planting plan and estimation

COURSE CONTENTS

Module I: Introduction to Planting Design

- Introduction to planting design. Planting design through ages, Differentiation between trees, shrubs, ground cover and creepers; Understanding and plant selection criteria in landscape – functional, ecological, visual, cultural and temporal; Appreciation and understanding plant use and selection, ecologically sustainable plant use, criteria for planting design.
- Structural characteristics of plants. Spatial functions of plants, ground level planting, below knee height, knee to eye level, above eye level planting, tree planting; creating spaces with

plants- Experience of spaces, use of planting to manipulate spatial experience, elements of Spatial composition – enclosure, dynamics and focus; Designing with canopy layers – 3 layers, 2 layers and single layer

- Functional considerations in planting design- Boundaries, screening, shade, shelter, barriers, functions of trees, shrubs 9hedges & shrubbery), groundcover and climbers; trees
- Visual composition in planting design- responses to plant material, A study on form, shape, colour, Texture, growth characteristics and suitability to different environments. Principles of visual composition in planting design; Dynamism in landscape design-planting for texture, leaf and flowers, plants for specific colour and season

Module II- Planting for ecology, environment and culture

- Planting design for ecology and habitat creation; Planting strategies and species for various types of habitats – wooded areas, riparian areas, forests, grassland and meadows, wetlands, coastal edges, waterside and aquatic planting, butterfly gardens
- Planting design for environmental improvement; slope retention, and plants for restoration of disturbed habitats like abandoned quarries and mines, soil conservation, microclimate improvement, windbreaks, shelter-belts
- Plants associated with culture specific to India and that of Kerala: sacred groves, religious values etc.; Plants for specific uses: Edible, medicinal, water, hydroponic gardens, butterfly gardens, bird attracting etc.

Module III- Planting for specific uses

- Planting design for highways, rural areas, urban areas, roadside planting in urban and rural areas, parking, industrial sites, corporate offices, hospitality & health sector etc.
- Planting for terraces, roofs, vertical gardens, air plants, improving air quality etc.; Xeriscaping benefits, principles, applications in design. Plants for sustainability, LEEDS and GRIHA ratings
- Growth rate of plants as criteria for plant choice for particular situations. Comparison of advantages and disadvantages of fast, medium and slow growing trees. The concept of nurse planting. Creating conditions for plant establishment, planting and transplanting trees and shrubs; Introduction to soft landscape working drawings, planting plans, specifications and estimation.

Note:

Periodical site visits to case studies etc. is a must to get a feel of the course and its application in design.

REFERENCES:

1.Nick Robinson, The Planting Design Hand book, Gower Pub., 1998

2. Brian Hackett,Planting Design, McGraw hill, 1979.

3. Bose. T. K. and Choudhary, Tropical Garden Plants in Colour, Horticulture and Allied Publishers, 1991.

4. Iyengar Gopalaswamy, Complete Gardening in India, Gopalaswamy Parthasarathy, 1991.

5. M.S. Randhawa, Flowering trees of India, National Book Trust , India, 1983.

SEMESTER II

19LA02005: LANDSCAPE ECOLOGY AND ECOSYSTEM ANALYSIS

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA02005	Landscape Ecology and Ecosystem Analysis	2	0	0	2	50	0	100	150

COURSE OVERVIEW

* To develop an understanding of the plant material and their role in ecology.
* Examines the ecology, growth characteristics, and landscape ecology

COURSE OUTCOMES

* Understanding the importance of ecology and the application of the same in ecologically sensitive areas

COURSE CONTENTS

Module I- Basics of Ecology

- Fundaments of Ecology: definition, scope; Components: biotic and abiotic; Definition of Environment and its components; the biosphere and its functioning; Ecological Processes- Energy flow-energy source, food chains, food webs, and trophic structure, ecological pyramids.
- Ecosystem ecology: Biogeochemical cycles; hydrologic cycle, nutrient cycles -carbon, nitrogen, sulphur, phosphorous, Bio-accumulation & Bio-magnification
- Population ecology, Carrying capacity, Limits to growth; Production ecology: Concepts of productivity - Primary and Secondary Productivity.

- Community ecology; Plant Associations-Mutualism, Parasitism, Commensalism, Amensalism; spatial structure, ecological niche and species diversity; Community Dynamics: Succession - Serial stages, Modification of physical environment, Climax formation, Analysis and Evaluation

Module II- Ecosystems and analysis

- Types of ecosystems, characteristics and prevalent vegetation; aquatic ecosystem and forest ecosystem in detail; Field ecology: Quadrat, line transect, community analysis; ecosystem functioning, and analysis
- Biomes of the world and adaptations of plants in different biomes; Phytogeographical Regions of India and Kerala; occurrence, environmental conditions and prevalent vegetation;
- Ecology of western Ghats, Vembanad lake, and Kol wetlands;

Module III- Landscape Ecology

- Introduction to landscape ecology; formation of various landforms; landforms and landscape process; pattern and structure of landscapes; concepts of patch, corridor and matrix
- Landscape dynamics and function, topological and chorological process within landscape , concept of landscape metrics, understanding dynamic interaction between landscape structure and function , ecological services of landscape.
- Ecological degradation and Ecological restoration:Reclamation and restoration of derelict landscapes, conservation and preservation of ecological fragile areas such as wetlands, creeks etc.; Selective case studies- Indian and International; conservation ordinances

References

1. Richard T.T. Forman & Michel Godron , Landscape Ecology, John Wiley & Sons;1986
2. Monica G. Turner & Robert H. Gardner, Landscape ecology in Theory and Practice
3. Odumn, Fundamentals of Ecology
4. Keith Reid and Co. , Man, nature and ecology
5. Kormondy , Concepts of ecology
6. Ecology of Plants- Modern Trends in Applied Terrestrial Ecology
7. Plant Ecology, Kluwer Academic Publishers
8. Landscape ecology, Kluwer Academic Publishers
9. Journal of tropical Ecology: Bimonthly, Cambridge

SEMESTER II

19LA02006: ELECTIVE I(WORKSHOP)

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA02006	Elective I(Workshop) 1. Forest Ecology and management 2. Water Management 3. Advanced Horticultural Practices	1	2	0	2	50	50	0	100

Note: Students shall make a report after a one week visit to suitable areas like nurseries, forests, protected areas, etc. After a detailed study, a report shall be made which will be evaluated. The course- in charge shall describe the methodology to be undertaken for the workshop/case studies in the course-plan.

1. FOREST ECOLOGY AND MANAGEMENT

COURSE OVERVIEW

* Understanding of forest ecosystem, protected areas and its management

COURSE OUTCOMES

Upon completion of the course,

* Role of forest ecosystem, its components and management.
* Practical exposure to forest biodiversity

COURSE CONTENTS

Module I: Forest and forest environment

- Structure of forest ecosystem; forest microclimate; Major forest types of the world; forest types and forest cover of India with special reference to South India; tree cover of India.
- Ecophysiology of forest trees: Characteristic of tropical trees; shoot growth in forest trees; phenology of trees; forest seed dormancy and germination; regeneration ecology of forest trees.

Module II: Forest Ecosystem Function & Dynamics

- Primary productivity of forest ecosystems; methods of measurement; productivity patterns; litter production and decomposition; Nutrient cycling and nutrient conservation strategies
- Forest hydrology
- Measurement of forest productivity; Ecological Succession; Forest disturbances; Forest fragmentation
- Fauna and protection of wild life corridors, buffers etc.

Module III: Forest ecosystem management

- History of forest management in India; joint forest management
- Forest fire; plantation forestry

- Application of remote sensing technique in forest ecology
- Deforestation and approaches to forestry conservation; Changing climate and their impact on forest and soil health.

REFERENCES:

1. Barnes, B V; Zak, D R; Denton, S R and Spurr, S R (1998). Forest ecology (4 th edition). John Wiley and Sons

2. Burton V. Barnes, Donald R. Zak, Shirley R. Denton, Stephen H. Spurr. 1998. Forest Ecology. John Wiley & Sons

3. Champion, H.G. and Seth, S.K. (1968). A revised survey of the forest types of India (Reprinted 2004). Natraj Publicaiton, Dehradun.

4. FSI (2009). State of forest report 2009. Forest Survey of India, Dehradun.

5. Kimmins, J.P. (2004). Forest ecology (2 nd edition). Pearson Education.

6. Ravindranath, N.H. (2004).Joint forest management in India. Oxford University Press.

2. WATER MANAGEMENT

COURSE OVERVIEW

* To understand the water efficient design for complex situations and special conditions through practical studies.

COURSE OUTCOMES

* In depth understanding of water management systems

COURSE CONTENTS

Module I: Waterfront development

- River front developments; sea front developments; treatment of catchment areas; edgings. Understanding floodplains; lake and catchment areas
- Streams in urban landscapes; natural drainage paths-treatments; canals; surface run-off calculations and design; edging. Urban and highway storm water pollution-types and treatments; storm water management; recharge; reuse

Module II: Storm Water and Rainwater management systems

- Water retention structures, water harvesting techniques and devices;
- Advanced irrigation control systems; smart water harvesting solutions.
- Erosion control systems

Module II: Decentralised waste water management systems

- Sewage water treatment and reuse in landscape, decentralised waste water treatment systems and its incorporation into landscape

REFERENCES

1) Viessman Warren(1985): Water Management-Technology and Institutions; Harper & Row.

2) Bansil P.C (2004): Water Management in India; Concept Publishing Company.

3) Vaidhyanathan(2004): Managing Water Scarcity; Lordson Publisher Pvt Ltd.

4) Walesh, Stuart G (1989): Urban surface water management; John Wiley New York.

5) 'Ecological Riverfront Design: Restoring Rivers, Connecting Communities, by Besty Otto, Kathleen McCormick , Michael Luccese.

3. ADVANCED HORTICULTURAL PRACTICES

COURSE OVERVIEW

* Obtaining an in-depth understanding of various horticultural types and management systems

COURSE OUTCOMES

* Hands on experience on specific horticultural types and management

COURSE CONTENTS

Module I: Horticulture for specified uses

- Horticultural practices for medicinal plants
- Horticultural practices for aromatic plants
- Kitchen gardens
- Orchards and vineyards
- Agro-forestry
- Protected horticulture

Module II- Horticultural management

- Soil fertility and nutrition management
- Nursery management for landscape projects
- Water management in plants

Module III: Manure and weed control

- Organic Farming and composting
- Weed management in ornamental plants

Module IV: Plant propagation methods

REFERENCES:

1. Raunkier.C., the Life forms of Plants and statistical plant geography, 1934.

2. Adams C R, Early M P, 2004. Principles of Horticulture. Elsevier, N. Delhi.

3. Barton West R, 1999. Practical Gardening in India. Discovery Pub. House, New Delhi.

4. Edmond J B, Senn T L, Andrews F S, Halfacre P G, 1975. Fundamentals of Horticulture (IV Edn).

TMH, New Delhi.

5. Sadhu M K, 1996. Plant Propagation. New age International publishers, N. Delhi

SEMESTER II

19LA02007: LANDSCAPE APPRECIATION

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA02007	Landscape Appreciation	1	2	0	2	100	50	0	150

COURSE OVERVIEW

* To make the students critically analyze designed/ natural landscapes and in the process develop a deep understanding of landscapes, together with art of written and oral expression of thoughts.

COURSE OVERVIEW

Upon completion of the course,

* Critical analysis of landscapes and the art of oral and written expression of the same.

COURSE CONTENTS

- Learning the art of critically appreciating a creative work, orally, in writing with graphical support.
- Learning to differentiate between the natural organizations and re-organization systems and man's designed interventions.
- Study of works of pioneer landscape architects.
- Site visit to a particular designed landscape (preferably related with thesis topic) and a complete documentation of the same including observational studies.
- Writing a report on the studied landscape and presenting the same in front of an audience.

SEMESTER III: SYLLABUS

SEMESTER III

19LA03001: LANDSCAPE DESIGN-III

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA03001	Landscape Design- III	0	0	10	10	150	150	0	300

COURSE OVERVIEW

To develop the skill to integrate various knowledge systems to arrive at a design proposal of a project, preferably with the involvement of the stakeholders.

COURSE OUTCOMES

Upon completion of the course,

* Landscape design of complex sites with multifaceted dimensions and resolving design problems with the involvement of stakeholders.

COURSE CONTENTS

* Features the process of solving complicated site planning and site design problems.
* Each phase of the site planning process is examined in detail by undertaking one or more studio problems that involve resolution of issues related to existing site conditions, program development, conceptual design, design development, and design detailing.

* The studio exercises will involve a combination of different situations – urban context, historical landscape, specialized landscape situations, landscapes etc. Understanding of ecologically sustainable development would be the underlying theme.

References:

1. Simonds. J. O. (1961). Landscape Architecture, The Shaping of Man's Natural Environment.London: F.W. Dodge Cooperation.

2. Harris.C.W and Dine.N.T ; (1997) Time Saver Standards For Landscape Architecture, Mcgraw – Hill International Edition, Arch. Series

3. Starke .B and Simonds. J. O. (2013) Landscape Architecture: A Manual of Site Planning and Design. 5 editions. McGraw-Hill Professional

4. Baker.B.H (1987) A Dictionary of Landscape Architecture.Albu : University Of New MexicoPress

5. Reid G. W: (1987) Landscape Graphics: Watson-Guptill

6. Shaheer .M, Dua G.W and Pal.A .(2012) Landscape Architecture in India: a reader .India: La, Journal of Landscape Architecture

7. Reid G. W: (1993)From Concept to Form: In Landscape Design. John Wiley & Sons

8. All publications by Brian Hackett

SEMESTER III

19LA03002: RESEARCH METHODOLOGY AND DISSERTATION

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA03002	Research Methodology and Dissertation	2	0	3	5	100	100	0	200

COURSE OVERVIEW

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

COURSE OUTCOMES

Upon completion of the course,

* Expertise in collecting, processing and presenting relevant information and the art of oral and written expression.
* Findings that can be taken forward for further studies/ design/research.

COURSE CONTENTS

- Introduction- Basic research issues and concepts- orientation to research process- types of research: historical, qualitative, co-relational, experimental, simulation and modelling, logical argumentation, case study and mixed methods- illustration using research samples
- Research Process- Elements of Research process: finding a topic- writing an introduction- stating a purpose of study- identifying key research questions and hypotheses- reviewing

literature- using theory- defining, delimiting and stating the significance of the study, advanced methods and procedures for data collection and analysis- illustration using research samples

- Researching And Data Collection- Library and archives- Internet: New information and the role of internet; finding and evaluating sources- misuse- test for reliability- ethics Methods of data collection- From primary sources: observation and recording, interviews structured and unstructured, questionnaire, open ended and close ended questions and the advantages, sampling- Problems encountered in collecting data from secondary sources
- Report Writing- Research writing in general- Components: referencing- writing the bibliography developing the outline- presentation; etc.
- Case Studies- Case studies illustrating how good research can be used from project inception to completion- review of research publications

Dissertation:

The course deals with selecting an appropriate topic (the topic for the research could be selected in a such way that it could help to develop an appropriate methodology and research approach related to the Landscape Architectural Project taken up in semester-IV from the field of landscape architecture or allied disciplines, for its theoretical exploration.

References:

1. Linda Groat and David Wang; Architectural Research Methods

2. Wayne C Booth; Joseph M Williams; Gregory G. Colomb; The Craft of Research, 2nd Edition; Chicago guides to writing, editing and publishing;

3. Iain Borden and Kaaterina Ruedi; The Dissertation: An Architecture Student's Handbook; Architectural Press; 2000

4. Ranjith Kumar; Research Methodology- A step by step guide for beginners; Sage Publications; 2005

5. John W Creswell; Research design: Qualitative, Quantitative and Mixed Methods Approaches; Sage Publications; 2002

6. Kothari, C.R. (2005) Research Methodology: Methods and Techniques, New Delhi: WishwaPrakashan.

7. Sanoff, H. (1977) Methods of Architectural Programming, Dowden Hutchinson and Ross, Inc. Vol. 29, Community Development Series.

8. Sanoff, H. (1991) Visual research methods in design, USA: Van Nostrand Reinhold.

SEMESTER III

19LA03003: PROFESSIONAL TRAINING

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA03003	Professional Training	0	4	0	2	50	50	0	100

COURSE OVERVIEW

* To give an opportunity to work in an office and give the student an exposure to real time challenges and situations of the profession.

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

COURSE CONTENTS

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

SEMESTER III

19LA03004: URBAN LANDSCAPE

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA03004	Urban landscape	2	0	0	2	50	0	100	150

COURSE OVERVIEW

* Understanding of approaches to the planning and design of urban public open spaces.

COURSE OUTCOMES

Upon completion of course,

* To make students understand the design aspects of successful urban landscape cases towards better quality of life.

COURSE CONTENTS

Module I: Introduction & Theory

• Urban Landscape and Urban Design, Urban Landscape and its benefits – ecological, social, health, economic, aesthetic; Sustainability and Urban Landscape, Urban ecology, urban water sheds.

• Open spaces with in urban environment – Natural and Artificial.–Brief introduction to natural and artificial types - street crossing/ square/ plaza/ promenade/ public space/ parks/ waterfronts/ wetlands/ with examples.

• Brief on factors forming Natural urban landscape – geographical features, climate, vegetation& Artificial urban landscape – Land use zoning, road pattern, formation of buildings, etc.

Module II: Urban open spaces

- Open space development in urban design context.Evolution of public park as a major component of urban landscape ; Open space development in new towns - Park systems, waterfronts, Green infrastructure,Vertical landscape.
- Urban spaces and its characteristics, Types of urban spaces, hierarchy of urban spaces - streets and squares. Streetscape and types of squares- Successful case studies.

• Cultural, social and aesthetic value of urban spaces and its perception - Enclosure of urban spaces, visual permeability, approach and axis – serial vision (Gorden Cullen), Imageability and legibility (Kevin Lynch) through landscape, aesthetics, sense of place.

• Urban space enhancement.–Enclosure quality, Public art and artifacts, hardscape and softscape, materials, furniture and lighting, signage.

Module III: Urban Landscape Design

• Design of public parks, streetscape, green ways- Hardscape and softscape, edge character, pavement / surface material selection, Plant / tree selection criteria, furniture and lighting of public space, signage, public art and artifacts.

• Design of parkways, waterfronts, promenade and plaza. - Hardscape and softscape, edge character, pavement / surface material selection, Plant / tree selection criteria, furniture and lighting of public space, signage, public art and artifacts.

• Maintenance and management of public spaces and parks – community participation, awareness programmes, public art / activities; Contemporary urban landscape issues, Case studies-Study, understanding and analysis of known examples at the national and international levels.

REFERENCES:

1. Garden Cullen, The concise Townscape, Architectural press, London.

2. Kevin Lynch, Image of City, Cambridge, MA, 1961.

3. Henry F. Arnold, Trees in Urban Design, Van Nostrand Reinhold Company.

4. Matthew Carmona, Tim Heath, Public places – Urban spaces, Architectural press, 2003.

5. Michael Hough, Cities and natural process, Routledge, 1995.

6. Donald Watson, Alan plattns, Roberta shibley, Time savers standards for urban design, McGraw hill, 2003.

7. Elements and total concept of urban landscape design, Graphic –sha publishing Co, 2001.

8. Tom turner, city as landscape, Eand FN spon, 1996.

9. Cliff Tandy, Handbook of urban Landscape, Architectural Press, 1970.

SEMESTER III

19LA03005: ENVIRONMENTAL LEGISLATIONS AND ECONOMICS

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA03005	Environmental Legislations & Economics	2	0	0	2	50	0	100	150

COURSE OVERVIEW

* To familiarize the students to the environmental legislation and its components and its role in checking the damage to the environment.

COURSE OUTCOME

Upon completion of the course,

* Understanding of global and Indian legislation for protection of environment and sensitivity towards environmental protection.

COURSE CONTENTS

Module I- Environment and Human Activities

- Environmental sciences, Environment – definition, types, important components, positive and negative impact of environment upon humans, Environmental impact of man's activities

on earth, impacts of agriculture, industrialization, housing & urbanization, transportation, mining etc; Environmental Valuation and Payment of Ecosystem services with national and international case studies

- Pollution – definition, pollution types- air, water, land, radioactive, noise &thermal and its impact on humans, vegetation and other life forms with appropriate case studies ; global issues like ozone layer depletion, acid rain, bio-magnification, green house effect, global warming, environmental crisis etc
- Environmental impact assessment – definitions, methodologies, techniques, advantages and disadvantages. Process – data collection, identification of study area, scope, aim, environmental standards and their measurement. EIA in India, legislation related to EIA, EIA in developed and developing countries

Module II: Global Environmental Framework & Legislations

- International framework related to landscape legislation, Role of UNEP and its framework, The Stockholm Declaration, The Vienna Convention for the Protection of the Ozone Layer, The Montreal Protocol on Substances that deplete the Ozone Layer, The Report of the World Commission on Environment and Development, Rio Declaration on Environment and Development
- The U.N Convention on Biological Diversity: Agenda 21, The U.N Framework Convention on Climate Change, UNFCCC, The Kyoto Protocol, The WSSD, 2002, International Environmental law, I.E.L : Precautionary principle and Polluter Pays Principle

Module III: Environmental Legislations in India

- Concept of law constitution in relation to environment in India, Role of MoEF, Indian forests acts and Biodiversity acts – preserved, protected, private and village forests, wild life sanctuaries act
- Legislative and administrative framework for conservation of forests, national parks, protected landscapes , bio reserves etc; Periphery control legislation and green belt concept; Forest policies related to Western Ghats in India- Kasthuri rangan and Gadgil Report
- Environmental legislation dealing with Town planning, Urban and rural planning; Legislation relating to preservation of parks, open spaces, playgrounds, trees and ancient monuments, Historic and protected Landscapes ; Preservation of the country-sides etc
- Legislation related to air, water, Land pollution prevention, Role of pollution control boards
- Policies related to wetland preservation and paddy conservation, CRZ rules etc.

References:

1. Birnie, P W & Boyle; (2002) International Law And The Environment, Marsh W; Landscape Planning : Environmental Applications; USA: Oxford University Press

2. Fischer T B; (2007) Theory And Practice Of Strategic Environmental Assessment: Towards A More Systematic Approach: Routledge

3. Jones C Ed.;(2005) Strategic Environmental Assessment And Land Use Planning : An International Evaluation: Routledge

4. Lee.J (1986) The Environment, Public Health And Human Ecology Consideration For Economic Development: The Johns Hopkins University Press

5. Saksena,K.D; Environmental Policies And Programs In India

6. Anuj Kumar Purwar (2012); Environment and Ecology:I.K International Publishers Pvt. Ltd

SEMESTER III

19LA03006: PROFESSIONAL PRACTICE

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA03006	Professional Practice	2	0	0	2	50	0	100	150

COURSE OVERVIEW

* To educate the students on the various aspects of a Landscape design practice.

COURSE OUTCOMES

Upon completion of the course,

* Understanding of professional practice, conduct and ethics

COURSE CONTENTS

Module I: Professional Practice

- Brief history of profession, Professional career tracks, Registration and License, professional ethics and code of professional conduct; Scope and meaning of professional services, scope of work and services to be provided.
- Types of client: Private, Government, Corporate etc. Professional relationship between client and Landscape Architect: Forms of agreement, conditions of engagement, Practical illustrations of various aspects of Client-Landscape Architect transactions, especially with regards to the establishment of credibility and trust.

- Scale of Professional Fees: Common and accepted methods of charging fees, percentage, lump sum, time-basis etc. Calculation and estimation of fee based on work involved. Taxes, remuneration and reimbursement.

Module II: Construction administration, Implementation process & Construction documents

- Sequence of activities from inception to completion: agencies involved at each stage, their professional relationships and obligations; Co-ordination of agencies and activities on site. Practical examples; budgetary control, progress evaluation and monitoring: various kinds of estimates, review and updating, simple examples of pert charts and bar diagrams.
- Site documentation: importance of written records, Site instruction book, periodic reports, visual records, bar charts etc., Techniques of inspection and quality control; visits to site under development.
- Contract Procedure; Criteria for selecting contractors: the process of calling tenders. Comparison of various kind of tenders with regard to objectives, utility and appropriateness; Tender Documentation and evaluation of tender; negotiations with contractors.
- Contract Documentation: Forms of contract; General and special conditions, specifications, Bill of quantities; significant clauses pertaining to defects, maintenance, arbitrations, etc; Parties to the contract; their roles, contractual relationships and legal obligations.

Module III: Regulations, Professional Institutes and Competitions

- Regulations and Legal Aspects- Codes, Standards, Bye laws and planning regulations applicable to building and landscape development. The role of statutory and regulatory bodies such as the Municipal Corporation, ISOLA, IFLA and Urban Art commission etc.
- Role of Professional Institute: Professional code of conduct. Relationship of Landscape Architect with other professionals;
- Landscape Design Competitions: Types, Guidelines

References:

1. Walter Rogers(1997): The Professional practice of landscape architecture; Van nostrand Reinhold.
2. John.L.Motloch(2001): Introduction to Landscape design.
3. Jack.E.Ingels(1992): Landscaping, Principles and Practices; Delmar publishers inc.
4. W.F.Hill (1995): Landscape handbook of Tropical Landscape; Garden Art Press.
5. Code of professional practice and competition guidelines of Council of Architecture

SEMESTER III

19LA03007: ELECTIVE II(THEORY)

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA03007	Elective II(Theory) 1. Landscape conservation, Planning & Management 2. Sustainable Landscapes 3. Landscape restoration	2	0	0	2	50	0	100	150

1. LANDSCAPE CONSERVATION, PLANNING & MANAGEMENT

COURSE OVERVIEW:

* To understand the basic principles and concepts related to conservation of Landscape and landscape planning.
* To outline the evolution of landscape planning, its premises and the process.

COURSE OUTCOMES:

Upon completion of course,

* Understanding the need for landscape conservation and planning and the principles related to them.

COURSE CONTENTS

Module I: Introduction to Landscape Conservation

- Importance of landscape conservation and various approaches to same; Landscape Conservation: Priorities, Policies and Programmes. National parks and other protective designations; Biodiversity and Biosphere reserves; Endangered landscapes; Aspects of watershed Management
- The application of landscape planning techniques to large scale developments such as infrastructure and power projects, extractive and manufacturing industry, new towns and urban extensions, and developments for tourism and eco-tourism.
- Conservation of natural resources; Understanding socio-cultural practices and its implications on landscape ecology; Ecological assessment and mapping of landscape with respect to biodiversity, soil, water etc. for understanding of ecologically sensitive sites; Conservation of historic and cultural landscapes.

Module II- Landscape Planning

- Relationship between man and nature; Analytical aspect of landscape; The natural and cultural setting; The purpose of landscape planning; Domain and context for landscape planning; Evolution of landscape planning; Landscape planning models; Application of G.I.S. and Remote sensing in Regional Landscape Planning; METLAND concept
- Process in landscape planning; principles of planning; procedure in landscape planning; problem defining, goal setting, inventory and analysis; basic of collecting and analyzing, projecting and presenting data in landscape planning; visual assessment and aesthetic dimension; Suitability analysis; Techniques for identifying preferences
- Concept of garden city and its evolution- Contemporary approaches in planning of cities; concepts and projects of McHarg, Carl Steinite, Warren Manning, Augus Hills, Phil Lewis – Izank Zonneveld, Ervin Zube
- Role of landscape architect in preparation of regional plans , city master plans , townships etc-Concept of Landscape Regionalism-Open space structure for a city and for a region-Landscape land-uses and related policy framework for regional landscape planning-Multidisciplinary framework for regional landscape planning; Introduction to the preparation of Landscape Conservation and Management Plan

Module III- Landscape Economics and Management

- Economics: Cost and benefits related to open space development; Tangible costs of development; capital and maintenance costs: intangible costs, depletion of natural resources, modification of ecological systems rehabilitation cost, social and cultural changes. Unit cost of development of open space.
- Management: Landscape management at the regional scale in relation to soil conservation, water management, grassland management, forestry and agriculture.
- Management practices related to urban ecology and urban habitats, such as urban forests, river banks, regional parks and green belts: ecological, economic and administrative issues.

REFERENCES:

1. Tom Turner (1998): Landscape Planning and Environmental Impact Design; UCL Press, London.
2. Richard L. Knight (2008): Conservation For A New Generation : Redefining Natural Resources Management; Island Press
3. Ervin H. Zube, Robert O Brush, JuliosG.Y.Fabos (1975); Landscape assessment – values, perceptions.

4. William M. Marsh (1997): Landscape planning – Environmental Application; John Wiley and sons Inc.
5. McHarg, I. L, (1969) Design with Nature, Garden City, N.Y: The Natural History Press.
6. Simonds, J.O; (1978) Earthscape- A Manual of Environmental Planning; NY: Mc Graw- Hill Book Company.
7. Lovejoy.D ; (1975) Landuse and Landscape Planning; Glasgow : Leonard Hill
8. Turner T;(1987) Landscape Planning, London : Hutchinson
9. Eaton R M; (2002) Ideal Cities : Utopianism And The(Un) Built Environment: Thames & Hudson
10. Selman Paul; (2006) Planning at the landscape scale: Routledge
11. Turner T; (1995) City As Landscape : A Post Postmodern View Of Design And Planning ; Taylor & Francis
12. Simonds J.O;(1994) Garden Cities 21- Creating a Livable Urban Environment; Mc Grae Hill, Inc.
13. Marsh W.M; (1983) Landscape Planning and Environmental Applications; New York: John Wiley and Sons, Inc.
14. Publications of Brian Hackett

2. SUSTAINABLE LANDSCAPES

COURSE OVERVIEW:

* To make students aware of the environmental, Energy and Water scenario of our planet in general and to appraise them of the urgent need of making all our landscapes sustainable.

COURSE OUTCOMES:

Upon completion of course,

* Understanding the importance of sustainable site planning & practical application possibilities in landscaping
* Critical awareness of existing environmental rating systems

COURSE CONTENTS

Module I: Introduction to Sustainability

- Basics of Sustainability, Needs of Sustainable Outlook, Sustainable Development, Concept of Renewable/Non-renewable, Global warming, Space-Ship-Earth concept, Natural resources, Objectives of Green Buildings and its relation to landscaping, Different Green rating systems around the world
- LEED India rating & TERI GRIHA rating and the relevance of landscape design in both rating systems; Sustainable site planning and landscaping strategies in green buildings through case studies
- SITES Rating for sustainable landscapes and study of case studies

Module II: Site Planning, Energy Conservation and Materials

- Site Planning strategies like Topographical considerations, Erosion control measures; promotion of public transport and pedestrian movement, Pollution control measures; Design for differently abled etc.
- Microclimatic strategies that can be incorporated in site planning
- Energy Efficiency, Reasons for Energy Crisis; Need for the Energy Conservation; Use of renewable energies for landscaping- Solar, wind, tidal and geothermal energy; Conflict of hydro projects and environment, Preferable materials for hardscaping, Sustainable hardscape construction and maintenance, Cradle to Grave Concept; Improvement of indoor air quality through landscape; Energy efficient construction techniques and earth shelters

Module III: Water conservation and Planting Strategies

- Rain data of India and Kerala, Calculation of tank sizes for storage of rain water in Kerala, Traditional harvesting systems, Methods and techniques for water conservation and Flood control- Detention and retention ponds, Infiltration ponds and trenches, Rain gardens, Green roof and suggested plants for green roof, Permeable paving etc; Fixtures in landscaping; Sustainable irrigation practices; Water conservation in green buildings and large areas
- Waste recycling, Management of Waste water and solid waste, Organic farming, Vermi-compost, De-centralised waste water treatment systems and case studies
- Planting strategies for sustainable landscaping- Native vegetation and types, types of lawn, xeriscaping, water requirements of tropical plants, Productive landscapes, Rain garden and its construction.

REFERENCES

1. Sue Reed(2010): Energy Wise Landscape Design; New Society Publishers
2. Owen E. Dell(2009): Sustainable Landscaping For Dummies; Wiley Publishing, Inc.
3. Robert. D. Brown(2010); Design with microclimate : the secret of comportable outdoor space; Island Press.
4. Joe Nasr, June Komisar and Mark Gorgolewski (2011); Carrot City: Creating Places for Urban Agriculture; The Monacelli Press
5. Storm.S and Kurt Nathan P.E;(1985) Site Engineering for Landscape Architects, AVI Publishing Company
6. 'A Water Harvesting Manual; for Urban Areas; Case Studies from Delhi'(2003), Centre for Science and Environment, New Delhi.
7. Bansal Naveendra K., Hauser Gerd and Minke Gernot (1997), "Passive Buildings Designs : Handbook of Natural Climatic Control", Elsevier Science, Amsterdam.

8. www.sustainablesites.org
9. www.cseindia.org
10. Websites of TERI, LEED India etc.

3. LANDSCAPE RESTORATION

COURSE OVERVIEW:

* To understand the principles and concepts related to landscape restoration

COURSE OUTCOMES:

Upon completion of course,

* Understanding of landscape restoration and process of restoration of different types of degraded land uses

COURSE CONTENTS

Module I: Introduction to Landscape Restoration

- Disturbed landscapes & types; Functional and dysfunctional landscapes; Economic, Social and Environmental objectives; factors influencing methods of restoration; Selecting Appropriate Reclamation Methods, Materials and Developing a Plan for restoration, General procedure for restoration.
- Protection of Soil, Water Quality, and adjacent undisturbed Areas; sediment and erosion control devices and technologies, temporary degradable materials, Turf Reinforced Mats, Hard Armour Systems etc
- Surface Conditioning: Stabilizing of top soil, improvement of water retention capacity, Modifying Acidic Soils, Saline Soils; Applying Fertilizers, Seedbed Preparation, Mulches etc

Module II- Wetlands and phytoremediation

- Wetlands: definition, types, ecologic and remediating property of wetlands, Constructed wetland types; Phytoremediation & its process, Types- Rhizofiltration , Phytotransformation , Plant-Assisted Bioremediation , Phytoextraction , Phytostabilization & Plant-Assisted Bioremediation, Types suitable for groundwater remediation and soil remediation, plants used in each types, harvesting and disposal of plant material after restoration.
- Restoration of aquatic ecosystems through ecologic restoration: Principles of ecologic restoration; Evaluation of disturbance and ecosystem degradation, Land-uses that can be offered after restoration through case studies: e.g. Cheonggyecheon stream restoration, Successful case studies in India and other countries, works of Turenscape and similar works.

Module III: Landscape Restoration for Specific Types

- Restoration of mining sites- Setting the goal, Assessment of conditions and defining the problem, Evaluation of water retaining capacity and soil structure, design solutions and applicable technologies, treatment of topsoil and planting, Land-uses that can be offered after restoration through case studies. E.g.: Bauxite Mining, Gove Peninsula, Northern Australia; Gold Mining, East Kalimantan, Indonesia etc
- Restoration of quarries: Setting the goal, Assessment of conditions and defining the problem, Evaluation of water retaining capacity and soil structure, design solutions and applicable technologies, treatment of topsoil and planting, Land-uses that can be offered after restoration through case studies. E.g.: Bauxite Mining, Gove Peninsula, Northern Australia; Gold Mining, East Kalimantan, Indonesia etc.
- Restoration of landfills: Landfills; Open dump and sanitary landfills; typical section of a sanitary landfill, Components of a landfill, Leachate and methane gas in landfills; Restoration procedure for landfills; Land-uses that can be offered after restoration through case studies. e.g. The Fresh Kills Park
- Restoration of brownfields: Assessment of contaminant levels in soil and groundwater; Removal of pollutants; Land-uses that can be offered after restoration through case studies e.g. Highland Park

REFERENCES

1. Harris.C.W and Dine.N.T ; (1997) Time Saver Standards For Landscape Architecture, Mcgraw – Hill International Edition, Arch. Series
2. David G. Tongway & John A.Ludwig (2011): Restoring Disturbed Landscapes: Putting Principles into Practice; Island Press
3. R. Bobbink, B. Beltman, J.T.A.Verhoeven, & D.F.Whigham(2006): Wetlands: Functioning, Biodiversity Conservation, and Restoration;Springer
4. Raymundo E. Russo(2008):Wetlands: Ecology, Conservation and Restoration; Nova Science Publishers, Inc.
5. Martin R. Perrow & Anthony J. Davy(2002):Handbook of Ecological Restoration; Cambridge University Press.
6. Justin. B.Hollander, Niall. G. Kirkwood & Julia.L.Gold (2010): Principles of Brownfield Regeneration; Island Press
7. Tim Dixon, Mike Rako, Philip Catney& David Liner(2007): Sustainable Brownfield Regeneration- Liveable Spaces from problem spaces; Wiley- Blackwell

SEMESTER IV: SYLLABUS

SEMESTER IV

19LA04001: LANDSCAPE ARCHITECTURE THESIS

Course Code	Course	Hrs Per Week			Credits	Marks			Total
		T	W/L	S		CA	UE		
							Jury	Written	
19LA04001	Landscape Architecture Thesis	0	0	25	25	300	300	0	600

Course Overview

To enable a student to independently conceptualize and develop a landscape architectural project with a policy and/ design level proposal for the same.

Course Contents

1. Each student is required to select an independent study, with reference to a special topic in Landscape Architecture, before the end of third semester in consultation with the faculty members.

2. Identification of the project with its significance, scope and limitations

3. Programming research related to the project and evolving the project brief

4. Preparing a project proposal and presenting it in graphical and textual format.

References:

All books/ Journals/ Magazines/ unpublished/published research/websites related to the topic selected by the individual student.