

### **Green Building Concepts:**

Green Building Concepts, Various Green rating agencies in India,

Green Construction, materials

(Activity 3)

Net Zero Energy Building Concepts -

Case Study -

<http://fairconditioning.org/showcase/net-zero-energy-nze-building-at-cept-university/>

**Teaching-Learning Process**

- 1) Use of theory, activities, sketches, drawings, assignment and tutorial for teaching.
- 2) Evaluation by quiz, tests, classroom activities.

### **Module-5**

#### **High Performance Materials:**

Smart Materials: Properties of Smart Materials, Applications in Building Industry

Nano Materials: Introduction to Nanotechnology in building materials, Applications in Building Industry.

**Teaching-Learning Process**

- 1) Use of theory, activities, sketches, drawings, assignment and tutorial for teaching.
- 2) Evaluation by quiz, tests, classroom activities.

#### **Course outcome (Course Skill Set)**

1. The students will be able to adopt innovation in Building Industry and use it in high rise projects.
2. The students will be able to apply various advances in High Performance Materials in building construction.

**Assessment Details (both CIE and SEE)**

(methods of CIE need to be define topic wise i.e.- Submission of construction drawing sheets, Journal of materials, Multiple Choice Question, Quizzes, Open book test, Seminar or micro project)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain a minimum of 50% marks individually both in CIE and 40 % marks in SEE to pass. Semester End Exam (SEE) is conducted for 50 marks (Viva-voce) and a minimum of 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together. Based on this grading will be awarded

**Continuous Internal Evaluation:**

1. Methods suggested: Submission of Construction sheets, Journal of Materials, Test, Written Quiz, Seminar, report writing etc.
2. The class teacher has to decide the topics for the test, Written Quiz, and Seminar. In the beginning, only the teacher has to announce the methods of CIE for the subject.

**Semester End Examination:**

1. The student need to submit his/her works done throughout the semester, including rough sheets for Viva voce examination, atleast one day prior to Viva voce examination to the course teacher/coordinator.
2. The work will be evaluated by an external teacher appointed by the University along with Course teacher or an internal examiner.
3. The SEE mark list generated is to be signed by both internal and external examiners and submitted to VTU in sealed cover through the Principal of the institution.

**Suggested Learning Resources:****Books**

1. Andrew Watts, "Modern Construction Handbook", : 4th Edition
2. Andrew Watts, "Modern Construction Case Studies: Emerging Innovation in Building Techniques", Birkhauser Basel.

**Web links and Video Lectures (e-Resources):**

- <https://ndl.iitkgp.ac.in>
- <https://www.youtube.com/watch?v=UasKtLCNcrA>
- <https://www.youtube.com/watch?v=2-t2c9eiFyQ&t=44s>
- <https://www.youtube.com/watch?v=ZHVXWxEFqWI>
- <https://www.youtube.com/watch?v=TGEEdMKjSieg>
- <https://www.youtube.com/watch?v=VE2tpwGCNOU>
- [https://www.youtube.com/watch?v=8FCyq6Tq\\_jo](https://www.youtube.com/watch?v=8FCyq6Tq_jo)
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**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

Activity 1 - **Exploring Recycled Materials** - research and documentation on material innovations, repurposed or made out of waste and their applications globally (Ecoboard, Using plastic for roads, plastic based pavers, Carbon captured products, Bio-waste, etc.)

Activity 2 - **Building Surgery** - Identify a settlement or a locality (informal / very old/ heritage) and enlist problems the space and the dwellers are experiencing. Derive ways for an architect to address them through repurposing and retrofitting.

Activity 3 - **Green Building** - Critical analysis of the green building concept. Debate and discuss the future implications of green buildings.

**IX Semester**

<b>Urban Planning</b>			
Course Code	<b>21ARC93</b>	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	3
<b>Course objectives:</b> <i>To familiarize students with the origins and basic concepts of urban planning.</i>			
<b>Teaching-Learning Process (General Instructions)</b> These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes. <ol style="list-style-type: none"> <li>1. Use of theory, activities, sketches, drawings, assignment and tutorial for teaching.</li> <li>2. Evaluation by quiz, tests, classroom activities.</li> </ol>			
<b>Module-1</b>			
<ol style="list-style-type: none"> <li>1. Evolution, origins and growth of settlements:- Characteristics of Rural and Urban settlements; Urban form based on different determinants – Natural (climate, topography, resources, geography) and Man-made (cultural, economic, religious, administrative, political).</li> <li>2. Planning efforts and impacts on historical cities - Ancient civilizations (Mesopotamia, China, Egypt, Indus Valley, Mayan); Classical cities (Greek, Roman, Medieval, Neoclassical, Renaissance, Baroque, City Beautiful); Indian cities – (Vedic/Indo-Aryan, Colonial, Dravidian, Mughal). Study how an old town grew and built itself organically in the nearby area.</li> </ol>			
<b>Teaching-Learning Process</b>	<ol style="list-style-type: none"> <li>1) The teacher can use PPTs, Videos to discuss the topics.</li> <li>2) The students need to sketch and note the discussions.</li> <li>3) Quizzes, models, seminars from students can be encouraged</li> </ol>		

<b>Module-2</b>	
<p>3. City Planning in Post-Industrial Revolution Era: - Responses to impacts of industrialization in cities: Legislative reforms to public health, work and living conditions; Spatial responses to Poor Living Conditions (Railroad tenements, Dumbbell plan); Utopian visions - Model Towns (Robert Owen, J.S. Buckingham, George Cadbury), Tony Garnier (<i>Cité Industrielle</i>).</p> <p>4. Pioneers in planning theories - Ebenezer Howard (Garden City), Soria Y. Mata (The Linear City), Patrick Geddes (Outlook Tower, Valley Section, Folk-Work-Place, Civic Survey), Le Corbusier (<i>Ville Contemporaine</i>), Frank Lloyd Wright (Broadacre City), Ludwig Hilberseimer (Decentralized City), Constantinos A Doxiadis (Ekistics), Clarence Arthur Perry (Neighbourhood Unit); Clarence Stein (American Garden Cities).</p> <p>5. Planned and Built Cities: - Brasilia (Oscar Niemeyer), Chandigarh (Le Corbusier), Islamabad (Constantinos A Doxiadis), Tel Aviv (Patrick Geddes).</p> <p>6. Alternate visions for cities: - Arcosanti (Paolo Soleri), New Urbanism (Peter Calthorpe, Andres Duany, Elizabeth Plater-Zyberk).</p>	
<b>Teaching-Learning Process</b>	<p>1) The teacher can use PPTs, Videos to discuss the topics.  2) The students need to sketch and note the discussions.  3) Quizzes, models, seminars from students can be encouraged</p>
<b>Module-3</b>	
<p>7. Urbanization in India: - Trends in urbanization in post-independence India; Planned cities in Post-Independence India (Bhubaneswar, Gandhinagar, Jamshedpur) (Activity1); Census classification of Indian cities (based on population size); Growth, issues and management of Metropolitan cities; Slums (official definitions and slum statistics) (Activity2), quality of infrastructure, environment and life in the Urban areas.</p> <p>8. Urban housing typologies - City Development Authority layouts, Public Sector Townships, Affordable housing, Slum Rehabilitation Projects (Activity 3, 4).</p>	
<b>Teaching-Learning Process</b>	<p>1) The teacher can use PPTs, Videos to discuss the topics.  2) The students need to sketch and note the discussions.  3) Quizzes, models, seminars from students can be encouraged</p>
<b>Module-4</b>	
<p>9. Urban Structure: - Internal spatial structure of the city: Concentric Zone theory; Sector theory; Multiple Nuclei Theory; Characteristics of Central business district, Urban nodes (Origin and/or destination of trips, location of major transport nodes, interfaces of local/regional transport), Suburbs, Peri-urban areas.</p> <p>10. Land use and Zoning: - Land use categories and representation; Relationship between Land use and Zoning; Zoning Types: Euclidian Zoning, Performance Zoning, Form-</p>	

based Codes, Incentive Zoning, Height Zoning (Activity 5), Open Space Zoning (Activity 6).	
<b>Teaching-Learning Process</b>	<ol style="list-style-type: none"> <li>1) The teacher can use PPTs, Videos to discuss the topics.</li> <li>2) The students need to sketch and note the discussions.</li> <li>3) Quizzes, models, seminars from students can be encouraged</li> </ol>
<b>Module-5</b>	
11. Planning Processes and Tools: - Urban Redevelopment: Renewal, Rehabilitation, Conservation; Scales of Planning: Master plan/Comprehensive Development Plan, Area Plan, Regional Plan, Perspective Plan, URDPFI Guidelines; Steps of urban planning.	
<b>Teaching-Learning Process</b>	<ol style="list-style-type: none"> <li>1) The teacher can use PPTs, Videos to discuss the topics.</li> <li>2) The students need to sketch and note the discussions.</li> <li>3) Quizzes, models, seminars from students can be encouraged</li> </ol>
<b>Course outcome (Course Skill Set)</b>	
<ol style="list-style-type: none"> <li>1) The students will be able to learn and compare the planning efforts during various eras.</li> <li>2) The students will be able to adopt planning ideas of pioneers in their projects.</li> <li>3) The students will be able learn and apply various planning standards, bye laws, rules in present context.</li> </ol>	

### **Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks (25 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures not less than 40% (20 Marks out of 50) in the semester-end examination(SEE), and a minimum of 50% (50 marks out of 100) in the CIE (Continuous Internal Evaluation) and a minimum of 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together. Based on this grading will be awarded.

#### **Continuous Internal Evaluation:**

Three Unit Tests each of **20 Marks (duration 01 hour)**

31. First test at the end of 5<sup>th</sup> week of the semester
32. Second test at the end of the 10<sup>th</sup> week of the semester
33. Third test at the end of the 15<sup>th</sup> week of the semester

Two assignments each of **10 Marks**

34. First assignment at the end of 4<sup>th</sup> week of the semester
35. Second assignment at the end of 9<sup>th</sup> week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks (duration 01 hours)**

36. At the end of the 13<sup>th</sup> week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

**CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.**

#### **Semester End Examination:**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

15. The question paper will have ten questions. Each question is set for 20 marks.
16. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

The students have to answer 5 full questions, selecting one full question from each module.

Theory paper will be out of 100 marks and will be **scaled down to 50 marks**.

### **Suggested Learning Resources:**

#### **Books:**

1. Kostof, S., Castillo, G., & Tobias, R. 1992. The city assembled: The elements of urban form through history. London: Thames and Hudson
2. Eisner, Simon; Gallion, Arthur; Eisner, Stanley. 1993. The Urban Pattern. Wiley.
3. Greed, Clara. 1993. Introducing Town Planning. Longman
4. Kostof, Spiro. 1993. The City Shaped: Urban Patterns and Meanings through History. Bulfinch.
5. Morris, A.E.J. 1994. History of Urban Form Before the Industrial Revolution. Longman Scientific & Technical.
6. Hall, Peter. 1996. Cities of tomorrow: An intellectual history of urban planning and design in the twentieth century. Oxford, UK: Blackwell Publishers.
7. Sivaramakrishnan, K. C.; Amitabh Kundu; and B. N. Singh. 2005. A Handbook of Urbanization in India: An Analysis of Trends and Processes, Oxford University Press, New Delhi.

8. Rathbone, Dominic. 2009. Civilizations of the Ancient World. Thomas & Hudson.
9. Ministry of Urban Development, GoI. 2014. Urban and Regional Development Plans Formulation and Implementation Guidelines. MoUD Government of India.

**Web links and Video Lectures (e-Resources):**

- <https://ndl.iitkgp.ac.in>
- <https://www.youtube.com/watch?v=BrhRpxL1rz4>
- <https://www.youtube.com/watch?v=2F0Bdfb1GqY>
- [https://www.youtube.com/watch?v=q\\_XmlG3CwNk&list=PLLy\\_2iUCG87AAaDRVrD02Y1z440Xt5shB](https://www.youtube.com/watch?v=q_XmlG3CwNk&list=PLLy_2iUCG87AAaDRVrD02Y1z440Xt5shB)
- [https://www.youtube.com/watch?v=vHop5VgamRc&list=PLLy\\_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=3](https://www.youtube.com/watch?v=vHop5VgamRc&list=PLLy_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=3)
- [https://www.youtube.com/watch?v=j\\_5GldeUpRg&list=PLLy\\_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=4](https://www.youtube.com/watch?v=j_5GldeUpRg&list=PLLy_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=4)
- [https://www.youtube.com/watch?v=zuM3u0du\\_5g&list=PLLy\\_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=5](https://www.youtube.com/watch?v=zuM3u0du_5g&list=PLLy_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=5)
- [https://www.youtube.com/watch?v=K9kst7RAfco&list=PLLy\\_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=6](https://www.youtube.com/watch?v=K9kst7RAfco&list=PLLy_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=6)
- [https://www.youtube.com/watch?v=Gkq-is4aLcQ&list=PLLy\\_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=7](https://www.youtube.com/watch?v=Gkq-is4aLcQ&list=PLLy_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=7)
- [https://www.youtube.com/watch?v=P4P6bAqq2hk&list=PLLy\\_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=8](https://www.youtube.com/watch?v=P4P6bAqq2hk&list=PLLy_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=8)
- [https://www.youtube.com/watch?v=XcrSwGqdo\\_U&list=PLLy\\_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=9](https://www.youtube.com/watch?v=XcrSwGqdo_U&list=PLLy_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=9)
- [https://www.youtube.com/watch?v=PI9gNQBfoOA&list=PLLy\\_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=10](https://www.youtube.com/watch?v=PI9gNQBfoOA&list=PLLy_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=10)
- [https://www.youtube.com/watch?v=i8LhbDjf2WU&list=PLLy\\_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=11](https://www.youtube.com/watch?v=i8LhbDjf2WU&list=PLLy_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=11)
- [https://www.youtube.com/watch?v=xKT8dOhJ0l0&list=PLLy\\_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=12](https://www.youtube.com/watch?v=xKT8dOhJ0l0&list=PLLy_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=12)
- [https://www.youtube.com/watch?v=f\\_R4KL0z2D4&list=PLLy\\_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=41](https://www.youtube.com/watch?v=f_R4KL0z2D4&list=PLLy_2iUCG87AAaDRVrD02Y1z440Xt5shB&index=41)

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning ( select any two)**

**Activity 1: Comparison of organic city and planned city:** Study an old city and a new city and analyze and delayer the organic and planned form of development; Identify and break down in its similarities, differences, responsiveness, habitability, scale, standard of living, infrastructure, etc.

**Activity 2: Spontaneous city:** Study an existing slum eg. Dharavi, Ram pir, etc. for newer perspectives of inclusivity and understanding the forces behind its throbbing growth. The earlier policies of slum removal, slum relocation, and slum resettlement have been renewed as redevelopment and up-gradation. Ref: [I09025054.pdf \(ijres.org\)](https://www.ijres.org/papers/vol9/I09025054.pdf)

**Activity 3: Experience a slum redevelopment project:** Visit a slum redevelopment project. Interview the slum residents and reflect on the pros and cons of the project. Identify what were the economic/political aspirations of this project and the impact of this project on the mindset of the residents?

**Activity 4: Experience a slum rehabilitation project:** Visit a slum redevelopment project. Interview the slum residents and reflect on the pros and cons of the project. Identify what were the economic/political aspirations of this project and the impact of this project on the mindset of the residents?

**Activity 5: Linkages between high rises and informal settlements (slums):** Visit an area, (commercial, residential) with high FSI and high rises and map the number and proximity of slums in and around the area. Research and read about the dynamics between that. This activity hints at the direct relationship between the development and growth of slums.

**Activity 6: Open Space Index (slums):** Study and map the number of open spaces in different zones (commercial, residential areas, office, institutional) and try to understand the open space index, planning approach and accessibility of them for different economic sections. Research about the open space index in different cities, countries and the quality of life



## IX Semester

Thesis Seminar			
Course Code	21ARC94	CIE Marks	100
Teaching Hours/Week (L:T:P: Studio: Seminar)	2:0:0:4:1	SEE Marks	--
Total Hours of Pedagogy	85	Total Marks	100
Credits	07	Exam Hours	--

### Course objectives:

- (a) To outline the larger focus and relevance of the Thesis topic (design/research), its architectural implications and projected design results.
- (b) Alternatively to conceptually formulate an architectural proposition, explore and articulate ideas through research and critically evaluate the feasibility of the Thesis Proposal. This includes determining the Project, context where it shall be explored and its significance to architecture.
- (c) To encourage students to pose relevant questions on the discipline (theoretical/design); to undertake self-directed study with inquisitiveness, rigor and demonstrate a depth of inquiry in exploring the chosen topics.
- (d) To focus on innovation, experimentation (theoretical premise/ tectonics/modes of representation/other) as some of the learning outcomes and draw inspiration/build on the various Electives/ Design Studios proposed/taken through the undergraduate Program

### Teaching-Learning Process (General Instructions)

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.

### INTRODUCTION/OVERVIEW:

The Thesis Seminar course is designed to discover, frame and develop a Proposal for 21ARC94 Architectural Design Project (attempted in the X Semester). The objective of the Thesis Seminar is to expand the scope and focus of the student by introducing diverse topics in architecture (allied disciplines) and to nurture design/research projects that can make creative and technically competent contributions to the field of architecture. Every undergraduate student is required to undertake Thesis Seminar during their penultimate year.

The intent of the Thesis Seminar is to encourage new ideas/ research avenues/ design experimentation in architecture (allied disciplines); to provide a larger framework (structure) within which systematic research on a chosen topic can be undertaken; to develop a proposition, narrative and methodology for the chosen topic which can be tested through design in X Semester.

The Thesis Proposals can be developed from important issues on architecture (inter-disciplinary), hypothetical scenarios connected with architecture (theoretical premise) or live/ current projects proposed by government or other organizations.

### Note:

- a) The students are encouraged to continually read, discuss, clarify further and engage

with their chosen topics through IX Semester.

- b) Professional Training done in the VIII Semester should be seen as an opportunity to bring in new learning from the field/ industry into the chosen topic and be applied during designing and detailing in the Architectural Design Project in the X Semester.

**Teaching-Learning Process**

- 1) The teacher can use PPTs, Videos to discuss the thesis details.
- 2) The students need to choose topic based on their literature study.
- 3) Studio discussions, seminars from students.

**Course outcome (Course Skill Set)**

The final outcome shall include a formal submission of

- (a) Written Synopsis (key ideas on the topic including premise, description/ justification and conclusion) and Thesis Proposal Document (booklet) clearly highlighting/explaining the Project type; architectural Proposition/ Premise; Site/ Location; Scope and Limitations; Program (includes basic documentation with drawings, images or photographs of context, case studies, citations to various sources)
- (b) Portfolio of presentations, critical readings, drawings/ models produced by the student on the chosen topic (urban issue/ conservation/ sustainability/ digital architecture/ other)

The grading shall consider the participation and depth of inquiry presented by each student and the various submissions/ reviews on each topic organized through the term.

**Assessment Details (CIE)**

(methods of CIE need to be defined topic wise i.e.- Studio discussions, Reviews, Time problems, test, Seminar or micro project)

The weightage of Continuous Internal Evaluation (CIE) is 100% and there is no Semester End Exam (SEE) .The student has to obtain a minimum of 50% marks in CIE and is conducted for 100 marks. Based on the CIE marks grading will be awarded.

**Continuous Internal Evaluation:**

Methods suggested:

1. Studio discussions, Reviews, Time problems, CIE tests, Seminar or micro project, Quiz, report writing etc.
2. The class teacher has to decide the topic for the Thesis Seminars, in the beginning only. The teacher has to announce the methods of CIE for the subject in advance in writing.

**Semester End Examination:**

1. There is no Semester End Exam (SEE) The CIE marks list generated is to be signed by the internal examiners and submitted to VTU as per the procedure through the Principal of the institution.

**Suggested Learning Resources:**

**REFERENCES:**

- All references will be project specific and will include a wide range of subjects (history, theory and criticism; services; material and construction) from

architecture and allied fields addressed through critical papers, essays, documented studies and books.

- Linda Grant and David Wang, Architectural Research Methods, John Wiley Sons, 2002
- Iain Borden and Katerina Rüedi, The Dissertation, Architectural press 2000

**Web links and Video Lectures (e-Resources):**

- <https://ndl.iitkgp.ac.in>
- <https://www.youtube.com/watch?v=GKTbeG9NdpU>
- <https://www.youtube.com/watch?v=eW9Ma6nKnU>
- [https://www.youtube.com/watch?v=5cM3n\\_naMHY](https://www.youtube.com/watch?v=5cM3n_naMHY)
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**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

- 1) Library study, site visits, documentation of the learnings.
- 2) Individual seminars on the chosen topics.
- 3) Presentation in the form of portfolio, report, etc.

**IX Semester**

<b>Construction and Project Management</b>			
Course Code	<b>21ARC95</b>	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	<b>2:1:0:0</b>	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	3
<p><b>Course objectives:</b>  <i>To enhance the professional ability of the student to manage a construction project by exposing the students to the currently prevalent techniques in the planning, programming and management of a construction project. To enhance the professional ability of students towards a mindful project management approach as against a 'mechanistic' approach.</i></p>			
<p><b>Teaching-Learning Process (General Instructions)</b>            These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> <li>1. Use of theory, activities, sketches, drawings, assignment and tutorial for teaching.</li> <li>2. Evaluation by quiz, tests, classroom activities.</li> </ol>			
<b>Module-1</b>			
<b>(Introduction to Construction Project Management &amp; Construction Organization)</b>			
<ol style="list-style-type: none"> <li>1. <b>Introduction to Project, its Stages and Construction Project management:</b> Project, Organisation, need for management of building/construction projects, Principles and Objectives of Project Management, brief understanding about study areas in Project Management. Types of Construction Projects, Life Cycle Stages of a Project (Construction Project).</li> <li>2. <b>Construction Organisation:</b> Types of construction firms/ companies. Types of organization, study of organizational structures suitable for building and construction projects, the roles of the various members of a typical construction organization, qualities of an ideal construction organization, ethics in construction industry.</li> </ol>			
<b>Teaching-Learning Process</b>	<ol style="list-style-type: none"> <li>1) The teacher can use PPTs, Videos to discuss topic.</li> <li>2) Quizzes, models, seminars from students can be encouraged</li> </ol>		
<b>Module-2</b>			

### (Decision Making & Role of Project Managers)

3. **Decision making and Feasibility Study:** Involvement and Roles of Consultants and Contractor in decision making at various stages. Basic understanding of decision making principles and tools (e.g. Decision Tree, SWOT Analysis, Cost-Benefit Analysis), Value Engineering, Investment Criteria, Project Feasibility Study.

**Computer applications in Project Management:** Introduction to use of computers for solving inventory, scheduling and other issues related to construction and management.

4. **Roles of Project Manager:** Roles & Responsibilities of Project/ Construction Managers, **Scope Management in Construction:** Scope Planning, Definition, Verification and Control **Project Management Stages:** Project planning, project scheduling and project controlling.

Teaching-  
Learning  
Process

- 1) The teacher can use PPTs, Videos to discuss topic.
- 2) Quizzes, models, seminars from students can be encouraged

#### Module-3

### (Construction Management Techniques: Project Planning & Scheduling)

5. **Time, Cost and Resource Management in Construction:** Activity definition, Activity Sequencing, Estimation of Resource Requirements, Time & Cost for an Activity, Schedule Development, Budgeting, Schedule control, Cost Control.

**Construction Management Techniques: Project Planning** – Work Breakdown Structure;

6. **Construction Management Techniques: Project Scheduling** – Bar Chart, Milestone Chart, Network Theories (CPM and PERT analysis) - Event, activity, dummy, network rules, graphical guidelines for network, numbering of events;

**Project Cost analysis** (Indirect project cost, direct project cost, slope of the direct cost curve, total project cost) & brief understanding of about time, cost and resource optimization; Project Crashing (using CPM).

Teaching-  
Learning  
Process

- 1) The teacher can use PPTs, Videos to discuss topic.
- 2) Quizzes, models, seminars from students can be encouraged

#### Module-4

### (Construction Management Techniques: Project Monitoring and Control)

7. **Construction Management Techniques: Project Monitoring and Control** – Role of the project manager in monitoring the specifications, Follow-up for quality control, the measurement book (MB), RA bills, interim and final checking and certification of works on site based on the BOQ and terms of contracts. Project updating, Progress Curves.

<p>8. <b>Quality Management in Construction:</b> Quality Planning and Quality Control. Technical Specifications and Procedures. Codes and Standards.</p> <p><b>Construction Health and safety and management:</b> Safety Measures and management: Integrating workers' Health and Safety into management.</p>	
<b>Teaching-Learning Process</b>	<p>1) The teacher can use PPTs, Videos to discuss topic.</p> <p>2) Quizzes, models, seminars from students can be encouraged</p>
<p><b>Module-5</b></p> <p><b>(Use of Construction Equipment)</b></p>	
<p>9. <b>Construction Equipment:</b> The role of equipment/machinery in construction industry, factors affecting selection of construction machinery, standard versus special equipment, and understanding of the various issues involved in owning, operating and maintaining of construction equipment, economic life of equipment.</p> <p>10. <b>Types of Construction Equipment:</b> earth moving (JVB, tractors, excavators, dragline, trenching equipment, etc.) transporting (various types of trucks), spreading and compacting (motor graders and various types of rollers) and concreting equipment (including concrete mixers, transporting and pumping equipment), hoisting machines, form work, shoring material etc.</p> <p style="text-align: center;">Best practices - Dealing with uncertainty, complexity, timelines, in a mindful way.</p>	
<b>Teaching-Learning Process</b>	<p>1) The teacher can use PPTs, Videos to discuss topic.</p> <p>2) Quizzes, models, seminars from students can be encouraged</p>
<p><b>Course outcome (Course Skill Set)</b></p> <p>1) The students will be able to analyse the challenges in a construction project.</p> <p>2) The students will be able to appreciate the over view of</p> <p>3) The students will be able to understand the various roles to perform as a project manager.</p>	

### **Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks (25 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures not less than 40% (20 Marks out of 50) in the semester-end examination(SEE), and a minimum of 50% (50 marks out of 100) in the CIE (Continuous Internal Evaluation) and a minimum of 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together. Based on this grading will be awarded.

#### **Continuous Internal Evaluation:**

Three Unit Tests each of **20 Marks (duration 01 hour)**

First test at the end of 5<sup>th</sup> week of the semester

Second test at the end of the 10<sup>th</sup> week of the semester

Third test at the end of the 15<sup>th</sup> week of the semester

Two assignments each of **10 Marks**

First assignment at the end of 4<sup>th</sup> week of the semester

Second assignment at the end of 9<sup>th</sup> week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks (duration 01 hours)**

At the end of the 13<sup>th</sup> week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

**CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.**

#### **Semester End Examination:**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

The question paper will have ten questions. Each question is set for 20 marks.

There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

The students have to answer 5 full questions, selecting one full question from each module.

Theory paper will be out of 100 marks and will be **scaled down to 50 marks**.

### **Suggested Learning Resources:**

#### **Books/References:**

- 1) Dr.B.C.Punmia et al. "*Project planning and control with PERT and CPM*", Laxmi Publications, New Delhi
- 2) S.P.Mukhopadhyay, "*Project management for Architects' and civil Engineers*", IIT, Kharagpur, 1974
- 3) Jerome D.Wiest and Ferdinand K.Levy, "*A Management Guide to PERT/ CPM*", prentice Hall of India Pub, Ltd.,New Delhi, 1982
- 4) R.A. Burgess and G.White, "*Building production and project Management*", The construction press, London,1979.
- 5) A Guide to Project Management Body of Knowledge; 5<sup>th</sup> ed. – An American national standard – ANSI/PMI 99 – 001-2004
- 6) Krishnamurthy K. G., Ravindra S. V., "*Construction and Project management for Engineers, architects, planners and Builders*", CBS Publishers
- 7) Codes and standards –
  - NBC 2016 – Part 7
  - IS 3696 Safety code for scaffolds and ladders:
    - (Part 1) : 1987 Scaffolds
    - (Part 2) : 1991 Ladders
  - IS 3764 : 1992 Code of practice for excavation work (first revision)
  - IS 4082 : 1996 Recommendations on stacking and storage of construction materials and components atsite (second revision)
  - IS 4130 : 1991 Safety code for demolition of buildings (second revision)
  - IS 4912 : 1978 Safety requirements for floor and wall openings, railing and toe boards (first revision)
  - IS 5121 : 2013 Code of safety for piling and other deep foundations (first revision)
  - IS 5916 : 2013 Safety code for construction involving use of hot bituminous materials (first revision)
  - IS 7205 : 1974 Safety code for erection of structural steel work
  - IS 7969 : 1975 Safety code for handling and storage of building materials
  - IS 8989 : 1978 Safety code for erection of concrete framed structures
  - IS 13415 : 1992 Safety code for protective barrier in and around buildings
  - IS 13416 Recommendations for preventive measures against hazards at work places:
    - (Part 1) : 1992 Falling material hazards prevention
    - (Part 2) : 1992 Fall prevention
    - (Part 3) : 1994 Disposal of debris
    - (Part 4) : 1994 Timber structures
    - (Part 5) : 1994 Fire protection
  - IS 13430 : 1992 Code of practice for safety during additional construction and alteration to existing buildings
  - IS 15883 (Part 1) : Guidelines for construction project management: Part 1 General2009
  - IS 16601 : 2016 Guidelines for habitat and welfare requirements for construction workers.

#### **Web links and Video Lectures (e-Resources):**



- <https://ndl.iitkgp.ac.in>
- [https://www.youtube.com/watch?v=pwv1Nu3TO4A&list=PLWnoy5z\\_3BObBvFtBlowxM05D-q0VAWEs](https://www.youtube.com/watch?v=pwv1Nu3TO4A&list=PLWnoy5z_3BObBvFtBlowxM05D-q0VAWEs)
- [https://www.youtube.com/watch?v=4yzPzVCgRH4&list=PLWnoy5z\\_3BObBvFtBlowxM05D-q0VAWEs&index=2](https://www.youtube.com/watch?v=4yzPzVCgRH4&list=PLWnoy5z_3BObBvFtBlowxM05D-q0VAWEs&index=2)
- [https://www.youtube.com/watch?v=GAGoqqZSP4&list=PLWnoy5z\\_3BObBvFtBlowxM05D-q0VAWEs&index=3](https://www.youtube.com/watch?v=GAGoqqZSP4&list=PLWnoy5z_3BObBvFtBlowxM05D-q0VAWEs&index=3)
- [https://www.youtube.com/watch?v=kuCHsNXeNMc&list=PLWnoy5z\\_3BObBvFtBlowxM05D-q0VAWEs&index=5](https://www.youtube.com/watch?v=kuCHsNXeNMc&list=PLWnoy5z_3BObBvFtBlowxM05D-q0VAWEs&index=5)
- [https://www.youtube.com/watch?v=Nto1VbJSQWs&list=PLWnoy5z\\_3BObBvFtBlowxM05D-q0VAWEs&index=14](https://www.youtube.com/watch?v=Nto1VbJSQWs&list=PLWnoy5z_3BObBvFtBlowxM05D-q0VAWEs&index=14)
- [https://www.youtube.com/watch?v=ki0ld-KXfic&list=PLWnoy5z\\_3BObBvFtBlowxM05D-q0VAWEs&index=15](https://www.youtube.com/watch?v=ki0ld-KXfic&list=PLWnoy5z_3BObBvFtBlowxM05D-q0VAWEs&index=15)
- [https://www.youtube.com/watch?v=ypTiYyh7YT0&list=PLWnoy5z\\_3BObBvFtBlowxM05D-q0VAWEs&index=27](https://www.youtube.com/watch?v=ypTiYyh7YT0&list=PLWnoy5z_3BObBvFtBlowxM05D-q0VAWEs&index=27)
- <https://www.youtube.com/watch?v=pwv1Nu3TO4A&list=RDCMUCwEBggd6uleGIwY5B0GVFng&index=4>

### Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- 1) Visit to a medium size construction site to observe, discuss the challenges with stake holders.
- 2) Group or Individual seminar on learnings.
- 3) Quizzes, debates on a selected topic.

### IX Semester

EARTH QUAKE RESISTANT STRUCTURES			
Course Code	21ARC96	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	2:1:0:0	SEE Marks( VIVA)	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	--
<b>Course objectives:</b>			
<i>Integration of structures with architectural objectives by developing informed intuition for structures, emphasizing underlying concepts, synergy of form and structure towards creative design integration. To develop an understanding and design of structures for gravity and lateral seismic loads.</i>			
<b>Teaching-Learning Process (General Instructions)</b>			
These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.			
1. Use of theory, activities, sketches, drawings, assignment and tutorial for teaching.			
2. Evaluation by quiz, tests, classroom activities.			
<b>Module-1</b>			
1. <b>Term project Introduction:</b> High Rise Building (Plan and elevation with general framing arrangement).			
2. <b>National Building Code load calculation:</b> Gravity loading: Dead and live load calculation.			

<b>Teaching-Learning Process</b>	1) The teacher can use PPTs, Videos to discuss the topic. 2) The students need to sketch and note the discussions. 3) Quizzes, models, seminars from students can be encouraged
<b>Module-2</b>	
<p><b>3. Understanding earthquakes and Seismology:</b> Earthquake- Origin and Propagation; Complexity of Ground Motion; Earthquake occurrence in the world, plate tectonics, faults, earthquake hazard maps of India &amp; and the States. Causes of earthquake, seismic waves; magnitude, intensity, epicenter and energy release, characteristics of strong earthquake ground motions, Seismological Instruments: Seismograph, Accelerograph and Seismoscope.</p>	
<b>Teaching-Learning Process</b>	1) The teacher can use PPTs, Videos to discuss the topic. 2) The students need to sketch and note the discussions. 3) Quizzes, models, seminars from students can be encouraged
<b>Module-3</b>	
<p><b>4. Earthquake Effects on Buildings:</b> How buildings respond to earthquakes; Building forms and Seismic effects related to building configuration. Materials, Plan &amp; vertical irregularities, redundancy. Horizontal &amp; vertical eccentricities in mass and stiffness distribution, soft storey etc.</p> <p><b>5. Earthquake Resistant Design Strategies:</b> Concept of seismic design, stiffness, strength, period, ductility, damping, hysteric energy dissipation, center of mass, center of rigidity, torsion, design eccentricities.</p> <p>a. Seismic Resistance System  b. Seismic Isolation System  c. Seismic Damping System</p>	
<b>Teaching-Learning Process</b>	1) The teacher can use PPTs, Videos to discuss the topic. 2) The students need to sketch and note the discussions. 3) Quizzes, models, seminars from students can be encouraged
<b>Module-4</b>	
<p><b>6. Seismic Design to Satisfy Indian Codes:</b> Seismic loading based on IS 1893 Code Static Analysis Procedure: Horizontal seismic co-efficient, valuation of base shear, distribution of shear forces in single and multistory building.</p> <p><b>7. Structural Detailing in Earthquake Resistant Construction:</b> Seismic Detailing of Masonry buildings (IS: 4326), Seismic Designs &amp; Detailing of RC &amp; Steel Buildings: IS: 1893 - 2002; IS: 13920 - 1993; IS: 456 - 2000; IS: 800 - 2004.</p>	
<b>Teaching-Learning Process</b>	1) The teacher can use PPTs, Videos to discuss the topic. 2) The students need to sketch and note the discussions. 3) Quizzes, models, seminars from students can be encouraged
<b>Module-5</b>	
<p><b>8. Recent techniques:</b> Recent techniques like dampers, base isolation and other energy absorbing devises used in Earthquake resistant design.</p> <p>9. A case study highlighting the above concepts.</p>	
<p><b>Note: Studio work is involved in topics 1, 4, 5, 6, 7 and 9.</b></p>	
<b>Teaching-Learning Process</b>	1) The teacher can use PPTs, Videos to discuss the topic. 2) The students need to sketch and note the discussions. 3) Quizzes, models, seminars from students can be encouraged

**Course outcome (Course Skill Set)**

- 1) The students will be able to learn the importance of Earthquake Resistant Structures
- 2) The students will be able apply NBC and other safety measures while designing a Project.
- 3) The students will be able to observe the construction details required in a building.

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain a minimum of 50% marks individually both in CIE and 40 % marks in SEE to pass. Semester End Exam (SEE) is conducted for 50 marks (Viva-voce) and a minimum of 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together. Based on this grading will be awarded

**Continuous Internal Evaluation:**

Three Unit Tests each of **20 Marks (duration 01 hour)**

First test at the end of 5<sup>th</sup> week of the semester

Second test at the end of the 10<sup>th</sup> week of the semester

Third test at the end of the 15<sup>th</sup> week of the semester

Two assignments each of **10 Marks**

First assignment at the end of 4<sup>th</sup> week of the semester

Second assignment at the end of 9<sup>th</sup> week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks (duration 01 hours)**

At the end of the 13<sup>th</sup> week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

**CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.**

**Semester End Examination:**

1. The student needs to submit his/her works done throughout the semester, including rough sheets for the Viva examination, at least one day prior to the Viva work examination to the course teacher/coordinator.

1. The Viva-voce will be evaluated by an external teacher appointed by the University along with Course teacher or an internal examiner.
2. The SEE marks list generated is to be signed by both internal and external examiners and submitted to VTU in the sealed cover through the Principal of the institution.

**Suggested Learning Resources:****Books/References:**

1. Martin Bechthold, Daniel L Schodek , "Structures", PHI Learning Private limited.
2. Pankaj Agrawal and Manesh Shrikande , "Earthquake resistant design of structures", PHI learning Pvt. Ltd.
3. Dr Vinod Hosur , "Earthquake resistant design of building structures", Wiley Precise.
4. "Learning earthquake design and construction- earthquake tips", IIT Kanpur- NICEE
5. IS: 4326- Seismic detailing of Masonry buildings.
6. IS: 1893-2002, IS: 13920-1993 , IS: 456-2000, IS: 800-2007 – Seismic design and detailing of RC and steel structures.

**Web links and Video Lectures (e-Resources):**

- <https://ndl.iitkgp.ac.in>
- [https://www.youtube.com/watch?v=qht\\_3ONz80s](https://www.youtube.com/watch?v=qht_3ONz80s)
- <https://www.youtube.com/watch?v=9N8iQ9Ch8nw>
- <https://www.youtube.com/watch?v=f2tw4FA3gPA>
- <https://www.youtube.com/watch?v=IG54nYputwQ>
- <https://www.youtube.com/watch?v=V6pxan8bDg>
- [https://www.youtube.com/watch?v=NT\\_fVQ1LdQY](https://www.youtube.com/watch?v=NT_fVQ1LdQY)
- <https://www.youtube.com/watch?v=3oGPpejwFXw>
- 

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

- 1) Sketching of the typical details required in building components for earth quake resistance.
- 2) Group or Individual seminar on a EQRS and disaster management.
- 3) Quizzes, debates on a selected topic.

**IX Semester**

<b>Elective-6</b>			
Course Code	<b>21ARC97</b>	CIE Marks	100
Teaching Hours/Week (L:T:P: S)	2:0:0:0	SEE Marks	--
Total Hours of Pedagogy	25	Total Marks	100
Credits	02	Exam Hours	--

**Course objectives:**

- 1) To gain experience in aspects of Architecture not offered in the regular curriculum.
- 2) To study particular areas of the curriculum in greater depth.
- 3) To explore career opportunities in the allied fields.

**Teaching-Learning Process (General Instructions)**

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.

- 1) The teacher may use conventional method or an innovative method to deal with the subject.
- 2) The students need to work with hands on experiences to gain an expertise of the chosen field.
- 3) The teacher needs to use performance assessments to develop real life skills in the students.

**a) RESEARCH METHODS:**

**Objectives:**

*Introduction to research in architecture – its significance, research design, types of research, literature study, methods of research in architecture (interviewing / visual methods / content analysis); data documentation and analysis, introduction to statistics, presenting the data and reporting the research.*

- To increase the student understands of the role of research in architecture.
- To increase the student's abilities to interpret and evaluate research.
- To increase the student's abilities to conduct architecture research.
- To increase the student's abilities to present research results.
- To increase the student understands of data, information, and knowledge.

## **OUTLINE:**

**Unit 1- Introduction:** Introduction to “research” and its significance in architecture – meaning of research. Relationship between design and research. Types of research in architecture, areas of research in architecture, qualitative and quantitative paradigms.

**Unit 2- Research Design:** Components of research design – formulating the research questions, hypothesis, choosing the sample, methods of data collection, analysing the data and inferring from the data. Concepts of dependent and independent variables, unit of analysis. Defining the scope and limitations of a research plan, significance of the research outcome.

**Unit 3- Literature Study and Research:** Significance of literature study in research, different sources of information such as books, journals, newspapers, internet, magazines, audio recordings, etc. Referencing and documenting the bibliography.

**Unit 4- Methods of Research in Architecture:** Interview Techniques: Questionnaires /Face to face Interviews / Internet survey. Designing a Questionnaire / Interview schedule. Visual Techniques: Observations (participant / nonparticipant / direct), activity mapping, accession/erosion trace observations, cognitive maps, etc. Content Analysis: Secondary data analysis. Understanding the relative advantages, disadvantages and application of various methods mentioned above and choosing a method appropriate for a research to achieve its objectives.

**Unit 5- Data Documentation and Analysis:** Understanding the nature of data collected and methods of analysis suitable for that data (graphical / numerical / descriptive). Converting data into numerical form for data analysis.

**Unit 6- Introduction to the Statistics:** Introduction to the simple statistical methods of analysing numerical data – frequencies / percentages, mean / median / mode, inferring from the data and interpreting the meaning of those inferences. Use of MS Excel for statistical data analysis.

**Unit 7- Presentation of the Data:** Techniques of presenting the numerical data – graphical (pie charts, bar charts, line graphs etc.), tabulations, verbal qualitative data, architectural drawings / maps.

**Unit 8 - Reporting the Research:** Different sections of a research report, technical writing and language (tense, voice, etc.), formatting of a report.

## **REFERENCES:**

1. Groat, Linda N. and Wang, David C. 2002. **Architectural Research Methods**. New York: John Wiley.

Norman K Denzin and Yvonna S Lincoln (Eds.) **Handbook of Qualitative Research**, Thousand Oaks : Sage Publications, pp. 377392. 1994.

## **b) PRINCIPLES OF REAL ESTATE DEVELOPMENT:**

### **OBJECTIVE:**

*To provide students with understanding of fundamentals of real estate practices, perspectives & development, and enable them widen their professional capabilities to support endeavours based on socio-ecologically just development practices. To provide students with an understanding of the governing bodies and authorities dealing with housing and land, in the context of residential, commercial, infrastructure, commons in the local context.*

### **OUTLINE:**

**Unit-1: Introduction:** Definition of real estate, economic importance of real estate, overview of real estate industry.

**Characteristics of land / real estate:** Economic and physical characteristics, personal property; Tangible and intangible personal property.

**Unit-2: Concepts of Ownership:** Forms of ownership, physical rights of ownership of land, land tenure insecurity of Informal settlements and underlined reasons for that.

**Transfer of Title:** Voluntary and involuntary transfer of property, types of deeds and legal conveyance.

**Unit-3: Real Estate Finance:** Sources and techniques, financing large scale constructions.

**Unit-4: Land use and Control:** Public control of private property, zonal laws, enforcement of zonal laws, urban development, emerging patterns of urban land use, urban infrastructure development activities leading to forced evictions of people inhabiting marginalized settlements. (Research based Activity: Studying and critically analysing eviction laws and their impact. Case Studies of urban development projects that have lead to evictions of marginalized settlements) [Ref:\*) (Activity1)

**Unit-5: Role players in real estate development:** Stages in real estate development, real estate development process.

### **REFERENCES:**

1. Mike E. Miles, Laurence M. Netherton, and Adrienne Schmitz, "*Real Estate Development Principles and Process*" (5th Edition, 2015) by Urban Land Institute (ULI): Washington, D.C.
2. Richard B Peiser& Anne B. Frej, "*Professional Real Estate Development*" – The ULI guide to the business – (2003), Urban Land Institute U.S.A.
3. Tanya Davis, "*Real Estate Developer's Handbook*", (2007), Atlantic pub company, Ocala, USA.

4. Gerald R Cortesi, "*Mastering Real Estate Principles*" (2001), Dearborn Trade Publishing, NewYork, U.S.A.
5. Donald A. Corb& Richard A. Giovangelo, "*Real Estate Principles*", 2014 , Lee Institute, Inc., Brookline, Massachusetts, USA.
6. \*[https://www.hlrn.org.in/documents/Forced Evictions 2018.pdf](https://www.hlrn.org.in/documents/Forced_Evictions_2018.pdf)
7. \*\*<https://thewire.in/urban/housing-rights-covid-19-city-space-delhi-mumbai>

Activity based learning:

**Activity 1:** Students are to watch, critically analyse and have group discussions based on movies depicting land rights related challenges in informal settlements.

### **c) ADAPTIVE RE-USE OF BUILT FORM:**

**Objective:** To understand the theoretical and practical background for a systematic process to support adaptive re-use of the built environment for sustainable development.

#### **OUTLINE**

##### **1. Introduction**

- Introduction to the concept of adaptive reuse – history and various theories of adaptive reuse.
- Understanding adaptive re-use of buildings as a key to sustainable development. To explore the relationship between financial, environmental and social parameters associated with the adaptive re-use of buildings.

##### **2. Case studies**

- Understanding the application of the concept of adaptive-reuse through various case studies (within the country and abroad). Critical appraisal of the design approach of the case studies.
- Case studies should include examples of domestic, commercial, industrial, ecclesiastical and public building types. Analysis of the case studies should be based on the spatial attributes, structural knowledge and materiality of the existing structures and the strategies and tactics of adaptive reuse in architecture.

##### **3. Design generation processes in Adaptive re-use**

- Analysis of the existing structure - Importance of building assessment report – process of documentation and condition mapping in deciding design recommendations.
- Understanding the design logic. Role of various parameters in concept generation.
- Strategies for re-modelling.

##### **4. Adaptive re-use of heritage buildings**

- Understanding Adaptive re-use as an important strategy towards conservation of built heritage.
- Appreciation of the various values (architectural, cultural, historical, associational, social, etc.) that is associated with heritage buildings. Developing an ethical approach for adaptive re-use.

**Note:** The culmination of the elective could be a smaller scale adaptive re-use project done by the students inculcating all the ideas covered throughout the subject.

- Field visits and case studies help in better understanding of the concept of adaptive re-use.

#### **REFERENCES:**

1. Liliane Wong, " Adaptive Reuse: Extending the Lives of Buildings", 2016, Birkhauser Architecture, Switzerland.
2. J. Stanley Rabun, "Building Evaluation for Adaptive Reuse and Preservation", 2009, John Wiley & Sons.
3. Robert W. Burchell, "The Adaptive Reuse Handbook", Transaction Publishing , New Jersey.
4. Chris Van Uffelen, "Re-use Architecture", 2010, Braun Publishing, Switzerland.  
Robert T. Ratay, "Structural Condition Assessment" 2005, Wiley.

### **d) FUNDAMENTALS OF ENTREPRENEURSHIP**

#### **Objectives:**

*The key objective is to introduce the students to the fundamentals of entrepreneurship to develop entrepreneurial -mindset and personality that permeate the 21st century.*

- To understand who an entrepreneur is, importance of entrepreneurship, Key terms in entrepreneurship.
- To understand entrepreneurial traits, importance, and management of available resources
- To understand need to develop entrepreneurial mind- set, basics of business models
- To learn from success stories.
- To formulate business idea and develop Lean Canvas for a start-up

#### **OUTLINE:**

**Unit 1- INTRODUCTION:** Need of entrepreneurship, Innovation and entrepreneurship, Entrepreneur's vocabulary, Entrepreneurs V/S Wealth, Concepts of Entrepreneurship,

**Unit 2- ENTREPRENEURIAL TRAITS & RESOURCE MANAGEMENT:** Entrepreneurial traits, Resource organization and value creation, Types of resources, Entrepreneurial support system,

**Unit 3- ENTREPRENEURIAL MIND-SET & BUSINESS MODEL:** Entrepreneurial mind-set,



Misconceptions and myths about entrepreneurship, Business models, big company Vs Start ups

**Unit 4- Entrepreneurial success stories:** Lessons from various Case Studies

**Unit 5- Business Pitch for a Start up:** Developing Lean Canvas, Business Plan & Growth Strategies.

**Teaching-Learning Process (General Instructions)**

- Hands on exercise can be formulated after each chapter to apply the theoretical learning of the same with the help of case studies or scenario-based activities.
- Lean Canvas can be developed for the major project which will be their idea for a startup.
- A pitch video of 3 to 5 mins can also be developed as part of final submission

**REFERENCES:**

2. Arya Kumar (2012), "Entrepreneurship -Creating and Leading an Entrepreneurial Organization"
3. D.F.Kuratko, T.V.Rao 2009, "Entrepreneurship- A south-Asian Perspective

**OPEN ELECTIVE:**

The college has the discretion to offer an open elective in the areas/subject/field other than already covered under the syllabus. The college can decide to offer need based electives depending on the availability of the expertise. However, the college will be required to submit the title of such electives with the course outline stating learning objectives and mode of delivering the content to the Registrar/ Registrar (evaluation) within the 15 days of the commencement of the semester.

**Course outcome (Course Skill Set)**

- 1) To gain experience in aspects of Architecture not offered in the regular curriculum.
- 2) To study particular areas of the curriculum in greater depth.
- 3) To explore career opportunities in the allied fields.

### Assessment Details (CIE)

(methods of CIE need to be defined topic wise i.e.- Studio/ Class room/Tutorial discussions, Reviews, Time problems, test, Seminar or micro project)

The weightage of Continuous Internal Evaluation (CIE) is 100% and there is no Semester End Exam (SEE) .The student has to obtain a minimum of 50% marks in CIE and is conducted for 100 marks. Based on the CIE marks grading will be awarded.

#### Continuous Internal Evaluation:

Methods suggested:

1. Studio discussions, Reviews, Time problems, CIE tests, Seminar or micro project, Quiz, report writing etc.
2. The class teacher has to decide the course of learning for the Elective subject, in the beginning only. The teacher has to announce the methods of CIE for the subject in advance in writing.

#### Semester End Examination:

1. There is no Semester End Exam (SEE) The CIE marks list generated is to be signed by the internal examiners and submitted to VTU as per the procedure through the Principal of the institution.

#### Web links and Video Lectures (e-Resources):

- <https://ndl.iitkgp.ac.in>
- <https://sjbsap.edu.in/sthala-volume-2/>
- <https://www.youtube.com/watch?v=ZMMS71vYy5k>
- <https://www.youtube.com/watch?v=JlvGQm7KZTQ>
- <https://www.youtube.com/watch?v=nv7MOoHMM2k>
- <https://www.youtube.com/watch?v=7A-enw0rivY>
- <https://www.youtube.com/watch?v=mRux8G7X6L4>
- <https://www.youtube.com/watch?v=7bMpgBuoZY0>
- <https://www.youtube.com/watch?v=UEngvxZ11sw>

#### Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- 1) Participating in research method workshops/seminar
- 2) Visiting a real estate developer to get insight into the challenges of the real estate industry
- 3) Visiting a start-up to discuss the challenges they are facing to scale-up.

### X Semester

ARCHITECTURAL DESIGN PROJECT (Thesis)			
Course Code	21ARC101	CIE Marks	100
Teaching Hours/Week (L:T:P: S)	0:0:0:16	SEE Marks(VIVA)	200
Total Hours of Pedagogy	16	Total Marks	300
Credits	16	Exam Hours	-

#### Course objectives:

- a) To demonstrate an ability to comprehend the nature of architectural problem and create a brief which sets the frame work for design.
- b) To demonstrate an advanced level design ability to convert the brief set forth earlier into a speculative proposition of design.
- c) To articulate and delineate the propositions of design into an architectural solution addressing

all the dimensions using diagrams, analog or digital drawings and models.

**Teaching-Learning Process (General Instructions)**

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.

1. Studio discussions, activities, sketches, drawings, assignments for learning.
2. Evaluation by submission of drawings, Reports, open juries.

**INTRODUCTION:**

In principle, the final year Architectural Design Project, positioned at the culmination of multi- year architectural education program, constitutes the threshold between student's academic learning and the profession. It provides an opportunity to do more than demonstrate the accumulated skills and focus on actively engaging with the discipline by contributing new ideas, design solutions or exploring new dimensions to existing or current issues in the field. Ideally, the Architectural Design Project should continue with the Project Proposal submitted during 21ARC93 Thesis Seminar (conducted in the Ninth semester) and build/enhance/improve on the architectural narrative that sets the premise for design demonstration.

## **OUTLINE:**

Listed below are a few parameters that could govern, frame and aid in evaluating the projects. These parameters and stages should be fine-tuned depending on the resources. It is advised that the projects should be run as a design studio with individual guidance under one or more guides and project coordinator.

### **(a) Guidelines (scope, scale and limitations):**

- All projects should be grounded in some kind of critical enquiry; the depth of enquiry can be extended and the time spent on design can be reduced in a specific case, but such a project should demonstrate clarity in terms of research design. The suggested maximum weightage for study will be 25% in the case of a Study + Design Project.
- Selected projects can be of any scale and size (in terms of built areas) as long as the required rigor and depth is demonstrated by the student to merit consideration as a final project. It is advised not to attempt very large projects that have numerous structures and tend towards repetitive design with minimal variations or very complex projects due to time constraint.
- The scope of the project should firmly be in the purview of architecture even though it can have an interdisciplinary premise. All genres of projects (study or design) should end with a design solution or research dissertation.

### **(b) Generic studio model highlighting the salient stages**

- **Project seminar**– Student shall present a seminar on the project topic which would include the following
  1. Precedents of similar projects, either actual visit to such projects or through literature reviews.
  2. Cultural, contextual, historical, technological, programmatic concerns of the project.
  3. Prevalent or historical models of architectural approach to such projects and a critique of such models
  4. A rhetorical or a speculative statement that would be the basis of further investigation. (For example: Architecture in the information age: Design of libraries in the new virtual reality regime). Documentation which is a part of this presentation shall be taken as completion of “case study” part of the final requirement.
- **Mid Review**– There shall be a review to clarify the conceptual statements and assumptions of the students. Students shall present a clearly articulated design response to context, program and users. Conceptual framework and preliminary architectural scheme using drawings and models shall be the end products of this stage.
- **Final Review** – Final review should consist of all the works which would be presented at the viva. Mode of presentation shall be tentative but the body of work presented should demonstrate the intellectual rigour and skill of the student through the design process and must include various iterations (including study models) and the final design outcome. Number of sheets shall be limited to maximum of 20 plus two case study sheets.

**(c) Final output/outcomes:**

- The final output or body of work should include a report; detailed and completed analog and digital drawings and presentation model. In case of research dissertation an in depth research study of a specialised architectural component should be undertaken and presented in the form of a detailed report with proper references and appendix and a plagiarism check report not exceeding 15%.

**(d) Project Report:**

- Three copies of the reports shall be submitted for evaluation in the Viva. The report in typed or computer printed form shall provide an overview of the entire process from formulation of the project to the design resolution. It should discuss the program, site-analysis, literature review, case studies, design criteria, concept and include detailed design drawings from all stages and photographs of the models.

**Note:**

- a) The requirements pertaining to the differently abled, elderly people and children are to be addressed in design and detailing.
- b) At the time of Viva examination, the student shall show to the jurors the portfolio containing the evolution of his/her design from the beginning to the final output. All the drawings and reports shall be certified by the Principal of the School of Architecture as bona fide work carried out by the student during the semester.

**Teaching-Learning Process**

1. Studio discussions, activities, sketches, drawings, assignment for learning.
2. Evaluation by submission of drawings, Reports.

**Course outcome (Course Skill Set)**

- 1) The students will be able to learn the preparation of a Project Report.
- 2) The students will be able to apply his learning in the preparation of a Project Report.
- 3) The students will be able to work with a team or individually on a given assignment/project.

### **Assessment Details (both CIE and SEE)**

(methods of CIE need to be defined topic wise i.e.- Studio discussions, Reviews, Time problems, test, Seminar or micro project)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain a minimum of 50% marks individually both in CIE and 40 % marks in SEE to pass. Semester End Exam (SEE) is conducted for 200 marks (Viva-voce). Based on this grading will be awarded.

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain a minimum of 50% marks individually both in CIE and 40 % marks in SEE to pass. Semester End Exam (SEE) is conducted for 200 marks (Viva-voce) and a minimum of 50% (150 marks out of 300) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together. Based on this grading will be awarded

### **Continuous Internal Evaluation:**

Methods suggested:

1. Studio discussions, Reviews, Time problems, CIE tests, Seminar or micro project, Quiz, report writing etc.
2. The class teacher has to decide the topic for the Design and Seminars if any, in the beginning only. The teacher has to announce the methods of CIE for the subject in advance in writing.

### **Semester End Examination:**

1. The student needs to submit his/her works done throughout the semester, including rough sheets for the Viva examination, at least one day prior to the Viva work examination to the course teacher/coordinator.
2. The Viva-voce will be evaluated by Two external teacher appointed by the University along with Course teacher or an internal examiner.
3. The SEE marks list generated is to be signed by both internal and external examiners and submitted to VTU in the sealed cover through the Principal of the institution.

### **Suggested Learning Resources:**

#### **Books/ SUGGESTED REFERENCES:**

All references will be project specific and will include a wide range of subjects (history, theory, services, material and construction) from architecture and allied fields addressed through critical papers, essays, documented studies and books.

### **Web links and Video Lectures (e-Resources):**

- <https://ndl.iitkgp.ac.in>
- <https://www.youtube.com/watch?v=o03eZwvgb-c> (From COA social)
- <https://www.youtube.com/watch?v=SHwT6XwTTIY> (From COA social)
- [https://www.youtube.com/watch?v=5cM3n\\_naMHY&t=15s](https://www.youtube.com/watch?v=5cM3n_naMHY&t=15s)
- <https://www.youtube.com/watch?v=jW9oPt7-TA4>
- <https://www.youtube.com/watch?v=M1TiUa7cpm0>
- <https://www.youtube.com/watch?v=677ZtSMr4-4>

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

- 1) Sketching of the concepts, detailing. Working with study models.
- 2) Individual seminar on the project periodically to showcase the improvement.
- 3) Preparation of reports, editing the report, etc.