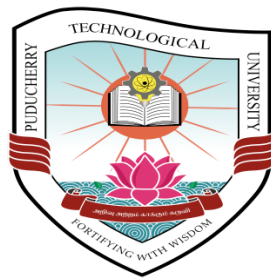


**PUDUCHERRY TECHNOLOGICAL UNIVERSITY
PUDUCHERRY-605014**

(A Technological University of Government of Puducherry)



NOTES ON AGENDA
of
the fifth meeting of
BOARD OF STUDIES
In
ARCHITECTURAL ASSISTANTSHIP
(Offline mode)

Held on Monday, 24th July 2023

Venue: Department of CIVIL Engineering
Puducherry Technological University

Time: 10:00 am

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1**For Approval**

Item 1.1	Curriculum and Syllabi for B.Tech - Architectural Assistantship offered in Constituent and Affiliated Colleges under Puducherry Technological University (<i>Effective from the Academic Year 2022 – 23</i>)
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The curriculum and syllabi of B.Tech. (Architectural Assistantship) programme offered in Constituent and Affiliated Colleges under Puducherry Technological University have been prepared and placed for approval of BoS. The same is enclosed in Annexure I.

Item 1.2	Course Outcomes (COs) and CO-PO Articulation Matrix revised for all subjects in the B.Tech- AA Syllabi of both PTU and Constituent / Affiliated Colleges
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The course outcomes(COs) and course outcome - program outcome (CO-PO) articulation matrix have been revised for all courses in the B.Tech –AA syllabi of Constituent/affiliated Colleges according to modified Bloom’s taxonomy and placed for approval of BoS. The same is enclosed in Annexure I.

2**Annexure**

Annexure I	Curriculum and Syllabi of B.Tech - Architectural Assistantship offered in Constituent / Affiliated Colleges under PTU (<i>Effective from the Academic Year 2022 – 23</i>)
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Annexure I

Curriculum and Syllabi of B.Tech - Architectural Assistantship offered in Constituent / Affiliated Colleges under PTU (*Effective from the Academic Year 2022 – 23*)

CURRICULUM

Curriculum for B.Tech. (Architectural Assistantship) is designed to fulfill the Program Educational Objectives (PEO) and the Program Outcomes (PO) as listed below.:-

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

PEO1	Strengthening the fundamental concepts	To prepare and train students in the fundamentals of mathematical and physical sciences, that ensures our students design and create energy-efficient built spaces.
PEO2	Core competence	To provide and train the students with comprehensive technical knowledge in all the fields of architecture and civil engineering aspects related to building and campus development, which will help them understand, analyze, and design various building projects.
PEO3	Professionalism & Management Skills	To learn the professional skills, ethics, and soft skills that are needed to manage crises and critical situations that would help them become professional engineers, either individually or in collaboration with other engineers.
PEO4	Sustainable skills	To educate the students on sustainable concepts and eco-friendly developments to design the building without affecting the balance of nature and other global issues related to the environment.
PEO5	Entrepreneurship skills	To explore the entrepreneurial mindset of the students to establish their own business according to societal needs and opportunities. This will also change the mindset of students from "job seeker" to "job provider."

PROGRAM OUTCOMES (POs)

PO1	The ability to apply knowledge of mathematics, science, and engineering	Engineering knowledge
PO2	The ability to define the context of design, analyze the user need & behavioral Characteristics and create the built environment to fulfill the functional and aesthetical needs.	Design, Development and Problem Analysis
PO3	The ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, health and safety, manufacturability, and sustainability.	Design of System Process and Components
PO4	The ability to identify, formulate, and solve engineering problems.	Solving Engineering Problems
PO5	The ability to use the Computer aided drafting & Rendering skills and modern engineering tools necessary for professional practice.	Modern Tools Usage
PO6	To apply contextual knowledge with justification to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional practice.	Engineer & Society
PO7	The broad education is necessary to understand the relationship exists between the building projects and the nature to avoid the environmental impact. Need to study the Characteristics of climate and sustainable concepts to promote eco friendly developmental activities.	Environment and Sustainability
PO8	To apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	Professional Ethics
PO9	The ability to understand the role and function of a member or leader of a team to attain the desirable results.	Individual and Team work
PO10	The ability to communicate effectively on exploring the features and impact of a building project to the client or the society in an efficient manner.	Communication Skills
PO11	To demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team to manage building projects and in Multidisciplinary environments.	Project management and finance
PO12	To recognize the need for, and have the Preparation and ability to engage in independent and life-long Learning in the context of changing life style, transition in the need and technology.	Life Long Learning

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.
PSO2	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology

Distribution of Credits among the subjects grouped under various categories

Courses are grouped under various categories and the credits to be earned in each category of courses are as follows:

Sl.nos	Category	Break up of Credits	Course Category Code (CCC)
1	Humanities, Social Sciences and Management Courses	6+2*	HSM
2	Basic Science Courses (Mathematics, Physics, Chemistry and Biology)	25	BSC
3	Engineering Science Courses (Workshop, Drawing, Basics of Electrical/Mechanical/Computer etc.,)	23	ESC
4	Professional Core Courses	67	PCC
5	Professional Elective Courses (from chosen discipline)	15	PEC
6	Open Elective Courses (from other technical/ emerging disciplines)	10	OEC
7	Professional Activity Courses (Seminar, Entrepreneurship, Comprehensive Test, Internship, Project Work)	14	PAC
8	Mandatory non-Credit Courses (Induction, Environmental Sciences, Indian Constitution, Essence of Indian Traditional Knowledge, Professional Ethics)	(Non-Credit)	MCC
		160	

***--Included in the 10 Credits under Open Elective Category**

Semester-wise Courses and Credits

Semester-I

Course Code	Course	Course Category Code (CCC)	SET	Periods			Credits
				L	T	P	
FYA101	Induction Programme	MCC	--	--	--	--	--
MAA101	Mathematics-I	BSC	TY	3	1	0	4
PHA101	Physics	BSC	TY	3	1	0	4
CYA101	Chemistry	BSC	TY	3	1	0	4
HSA101	English for Communication	HSM	TY	2	0	2	3
MEA101	Workshop and Manufacturing Practice	ESC	LB	0	0	3	1.5
PHA102	Physics Laboratory	BSC	LB	0	0	3	1.5
CYA102	Chemistry Laboratory	BSC	LB	0	0	3	1.5
Total				11	3	11	19.5
				25			

CCC - Course Category Code, SET – Semester Exam Type, TY – Theory, LB – Laboratory, PR – Project

Semester-II

Course Code	Course	Course Category Code (CCC)	SET	Periods			Credits
				L	T	P	
MAA102	Mathematics-II	BSC	TY	3	1	0	4
EEA101	Basic Electrical Engineering	ESC	TY	3	1	0	4
CSA101	Programming for Problem Solving	ESC	TY	3	0	0	3
MEA102	Engineering Graphics and Computer Aided Drawing	ESC	TY	2	0	4	3
CEA101	Environmental Science	MCC	TY	3	0	0	0
EEA102	Basic Electrical Engineering Laboratory	ESC	LB	0	0	3	1.5
CSA102	Programming Laboratory	ESC	LB	0	0	3	1.5
Total				14	2	10	17
				26			

CCC - Course Category Code, SET – Semester Exam Type, TY – Theory, LB – Laboratory, PR – Project

Semester-III

Course Code	Course	Course Category Code (CCC)	SET	Periods			Credits
				L	T	P	
SHA101	Biology for Engineers	BSC	TY	3	0	0	2
AAA101	Fundamentals of Architecture	PCC	TY	3	0	0	3
AAA102	History of World Architecture	PCC	TY	3	0	0	3
AAA103	Solid Mechanics	ESC	TY	3	1	0	4
AAA104	Building Services -I	PCC	TY	3	0	0	3
AAA105	Basic Design	PCC	LB	0	0	6	3
AAA106	Architectural Graphics	ESC	LB	0	0	3	1.5
AAA107	Building Construction and Detailing-I	PCC	LB	0	1	3	2
Total				15	2	12	21.5
				29			

Course Code	Open Elective Course	Course Category Code (CCC)	SET	Periods			Credits
				L	T	P	
ZZA3XX	Open Elective	OEC	TY	3	0	0	3

Semester-IV

Course Code	Course	Course Category Code (CCC)	SET	Periods			Credits
				L	T	P	
AAA108	Theory of Structures	BSC	TY	3	1	0	4
AAA109	History of Indian Architecture	PCC	TY	3	0	0	3
AAA110	Eco Friendly Building Materials and Construction	PCC	TY	3	0	0	3
AAA111	Site Survey and Planning	PCC	TY	3	0	0	3
AAA112	Building Services-II	PCC	TY	3	0	0	3
AAA113	Architectural Design-I	PCC	LB	0	0	6	3
AAA114	Building Construction and Detailing-II	PCC	LB	0	1	3	2
AAA115	Computer Applications in Architecture-I	ESC	LB	0	0	3	1.5
SHA102	Indian constitution	MCC	--	3	0	0	0
Total				18	2	12	22.5
				32			

Course Code	Open Elective Course	Course Category Code (CCC)	SET	Periods			Credits
				L	T	P	
ZZA3XX	Open Elective	OEC	TY	3	0	0	3

CCC - Course Category Code, SET – Semester Exam Type, TY – Theory, LB – Laboratory, PR – Project

Semester-V

Course Code	Course	Course Category Code	SET	Periods			Credits
				L	T	P	
AAA116	History of Modern Architecture	PCC	TY	3	0	0	3
HSA102	Industrial Economics and Management	HSM	TY	3	0	0	3
AAA117	Design of Structure-I	PCC	TY	3	1	0	4
	Professional Elective-I						
AAA201	1. Elements of Interior Design	PEC	TY	3	0	0	3
AAA202	2. Vernacular Architecture						
AAA203	3. Energy Efficient Architecture						
AAA118	Architectural Design-II	PCC	LB	0	0	6	3
AAA119	Building Construction and Detailing-III	PCC	LB	0	1	3	2
AAA120	Computer Applications in Architecture-II	ESC	LB	0	0	3	1.5
EPA101	Entrepreneurship	PAC	TY	3	0	0	2
Total				15	2	12	21.5
				29			

Course Code	Open Elective Course	Course Category Code (CCC)	SET	Periods			Credits
				L	T	P	
ZZA3XX	Open Elective	OEC	TY	3	0	0	3

CCC - Course Category Code, SET – Semester Exam Type, TY – Theory, LB – Laboratory, PR – Project

Semester-VI

Course Code	Course	Course Category Code	SET	Periods			Credits
				L	T	P	
AAA121	Urban Design	PCC	TY	3	0	0	3
AAA122	Project Management	PCC	TY	3	0	0	3
AAA123	Design of Structure-II	PCC	TY	3	1	0	4
	Professional Elective-II						
AAA204	1. Landscape Architecture	PEC	TY	3	0	0	3
AAA205	2. Housing						
AAA206	3. Town Planning						
AAA124	GIS Application in Town Planning	PCC	LB	0	0	3	1.5
AAA125	Architectural Design -III	PCC	LB	0	0	6	3
AAA126	Computer Application in Architecture - III	PCC	LB	0	0	3	1.5
SHA103	Essence of Indian tradition knowledge	MCC	--	3	0	0	0
Total				15	1	12	19
				28			

Course Code	Open Elective Course	Course Category Code (CCC)	SET	Periods			Credits
				L	T	P	
ZZA3XX	Open Elective	OEC	TY	3	0	0	3

CCC - Course Category Code, SET – Semester Exam Type, TY – Theory, LB – Laboratory, PR – Project

Semester-VII

Course Code	Course	Course Category Code (CCC)	SET	Periods			Credits
				L	T	P	
AAA127	Estimation and Specifications	PCC	TY	2	1	0	3
AAA128	Environmental Engineering	PCC	TY	3	0	0	2
	<u>Professional Elective-III</u>						
AAA207	1. Renewable Energy	PEC	TY	3	0	0	3
AAA208	2. Solar Power Engineering						
AAA209	3. Environmental Impact Assessment and Audit						
	<u>Professional Elective-IV</u>						
AAA210	1. Disaster Management	PEC	TY	3	0	0	3
AAA211	2. Earthquake Resistant structure						
AAA212	3. Contemporary Building Materials						
	<u>Professional Elective-V</u>						
AAA213	1. Glass Architecture and Design	PEC	TY	3	0	0	3
AAA214	2. Concepts and Approaches in Design						
AAA215	3. Services in High-rise Building						
AAA1290	Architectural Design -IV	PCC	LB	0	0	6	3
AAA130	Seminar	PAC	--	3	0	0	1
AAA131	Professional Practice, Law & Ethics	MCC	--	3	0	0	0
Total				20	1	6	18
				27			

Course Code	Open Elective Course	Course Category Code (CCC)	SET	Periods			Credits
				L	T	P	
ZZA3XX	Open Elective	OEC	TY	3	0	0	3

CCC - Course Category Code, SET – Semester Exam Type, TY – Theory, LB – Laboratory, PR – Project

Semester-VIII

Course Code	Course	Course Category Code	SET	Periods			Credits
				L	T	P	
SWA3XX	Open elective through SWAYAM	OEC	--	0	0	0	2
SWA3XX	Open elective through SWAYAM	OEC	--	0	0	0	2
AAA132	Comprehensive test	PAC	--	0	0	2	1
AAA133	Internship	PAC	--	0	0	0	2
AAA134	Project Work	PAC	PR	0	0	8	8
Total				--	--	10	15
				10			

CCC - Course Category Code, SET – Semester Exam Type, TY – Theory, LB – Laboratory, PR – Project

List of Professional Electives

Professional Electives	Course Code	Course	Semester
Professional Elective-I	AAA201	Elements of Interior Design	V
	AAA202	Vernacular Architecture	
	AAA203	Energy Efficient Architecture	
Professional Elective-II	AAA204	Landscape Architecture	VI
	AAA205	Housing	
	AAA206	Town Planning	
Professional Elective-III/IV/V	AAA207	Renewable Energy	VII
	AAA208	Solar Power Engineering	
	AAA209	Environmental Impact Assessment and Audit	
	AAA210	Disaster Management	
	AAA211	Earthquake Resistant structure	
	AAA212	Contemporary Building Materials	
	AAA213	Glass Architecture and Design	
	AAA214	Concepts and Approaches in Design	
AAA215	Services in High-rise Buildings		

List of Open Electives

Course Code	Course	Course Category Code (CCC)	SET
AAA301	Art and Architecture	OEC	TY
AAA302	Interior Design	OEC	TY
AAA303	Kitchen Design	OEC	TY
AAA304	Lighting in Buildings	OEC	TY
AAA305	Ornamental Gardens for Home	OEC	TY

Courses offered under various categories:

CCC	Course Code	Course	Semester	Credit	Total Credit
BSC	MAA101	Mathematics-I	I	4	25
	MAA102	Mathematics-II	II	4	
	PHA101	Physics	I	4	
	CYA101	Chemistry	I	4	
	PHA102	Physics Laboratory	I	1.5	
	CYA102	Chemistry Laboratory	I	1.5	
	SHA101	Biology for Engineers	III	2	
	AAA108	Theory of Structures	IV	4	
ESC	EEA101	Basic Electrical Engineering	II	4	23
	CSA101	Programing for Problem Solving	II	3	
	MEA102	Engineering Graphics and Computer Aided Drawing	II	3	
	EEA102	Basic Electrical Engineering Laboratory	II	1.5	
	CSA102	Programing Laboratory	II	1.5	
	MEA101	Workshop and Manufacturing Practice	II	1.5	
	AAA103	Solid Mechanics	III	4	
	AAA106	Architectural Graphics	III	1.5	
PCC	AAA115	Computer Applications in Architecture- I	IV	1.5	67
	AAA120	Computer Applications in Architecture- II	V	1.5	
	AAA101	Fundamentals of Architecture	III	3	
	AAA102	History of World Architecture	III	3	
	AAA104	Building Services -I	III	3	
	AAA105	Basic Design	III	3	
	AAA107	Building Construction and Detailing-I	III	1.5	
	AAA109	History of Indian Architecture	IV	3	
	AAA110	Eco Friendly Building Materials and Construction	IV	3	
	AAA111	Site Survey and Planning	IV	3	
	AAA112	Building Services-II	IV	3	
	AAA113	Architectural Design-I	IV	3	
	AAA114	Building Construction and Detailing-II	IV	1.5	
	AAA116	History of Modern Architecture	V	3	
	AAA117	Design of Structures-I	V	3	
	AAA118	Architectural Design-II	V	3	
	AAA119	Building Construction and Detailing-III	V	1.5	
	AAA121	Urban design	VI	3	
	AAA122	Project Management	VI	3	
	AAA123	Design of Structures-II	VI	3	
AAA124	GIS Application in Town Planning	VI	4		
AAA125	Architectural Design -III	VI	3		
AAA126	Computer Application in Architecture - III	VI	1.5		
AAA127	Estimation and Specifications	VII	4		
AAA128	Environmental Engineering	VII	3		
AAA129	Architectural Design -IV	VII	1.5		

PEC		<u>Professional Elective-I</u>	V	3	15
	AAA201	Elements of Interior Design			
	AAA202	Vernacular Architecture			
	AAA203	Energy Efficient Architecture	VI	3	
		<u>Professional Elective-II</u>			
	AAA204	Landscape Architecture			
	AAA205	Housing	VII	3	
	AAA206	Town Planning			
		<u>Professional Elective-III</u>			
	AAA207	Renewable Energy	VII	3	
	AAA208	Solar Power Engineering			
	AAA209	Environmental Impact Assessment and Audit			
		<u>Professional Elective-IV</u>	VII	3	
	AAA210	Disaster Management			
	AAA211	Earthquake Resistant structure			
AAA212	Contemporary Building Materials	VII	3		
	<u>Professional Elective-V</u>				
AAA213	Glass Architecture and Design				
AAA214	Concepts and Approaches in Design	VII	3		
AAA215	Services in High-rise Buildings				
OEC	ZZA301	Art and Architecture	III-VII	6	10
	ZZA302	Interior Design			
	ZZA303	Kitchen Design			
	ZZA304	Lighting in Buildings			
	ZZA305	Ornamental Gardens for Home			
OEC	SWA301 SWA302	Open Electives offered under SWAYAM	III-VII	4	
PAC	EPA101	Entrepreneurship	V	2	14
	AAA130	Seminar	VII	1	
	AAA132	Comprehensive test	VIII	1	
	AAA133	Internship	VIII	2	
	AAA134	Project Work	VIII	8	
HSM	HSA101	English for Communication	II	3	6/2
	HSA102	Industrial Economics and Management	V	3	
	SWA101	Humanities Open Electives offered by SWAYAM	VIII	2	

III SEMESTER

Department : Chemistry		Programme : B.Tech. (Architectural Assistantship)						
Semester : Third		Subject Category: BSC				Semester Exam Type: TY		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
SHA101	Biology for Engineers	3	0	0	2	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Classify the basic biological principle and organizational structure of living systems at molecular level.						
	CO2	Explain the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring .						
	CO3	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine.						
	CO4	Outline understanding of enzyme action and factors affecting their activity.						
CO5	Identify and classify microorganisms.							
UNIT-I	Classification	Periods: 10						
Classification outline based on (a) cellularity- Unicellular or multicellular (b) ultrastructure prokaryotes or eukaryotes (c) Energy and Carbon utilization -Autotrophs, heterotrophs, lithotropes (d) Ammonia excretion – amino telic, uricotelic, ureotelic (e) Habitats- aquatic or terrestrial (e) Molecular taxonomy three major kingdoms of life.							CO1	
UNIT-II	Genetics	Periods: 10						
Mendel's laws, Concept of segregation & independent assortment. Concept of allele. Recessiveness, and dominance. Single gene disorders in humans – Sickle cell disease, Phenylketonuria.							CO2	
UNIT-III	Biomolecules	Periods: 10						
Carbohydrates: Types, Structural & functional importance. Lipids: Classification - Simple, compound, & derived, Importance of lipid soluble vitamins. Amino acids – general structure, essential amino acids. Proteins - Levels of protein structure, structural & functional importance of proteins, Enzymes- Definition, Enzyme Activity & Units, Specific Activity, Specificity, Factors affecting enzyme activity. Nucleic acids: Types and importance.							CO3	
UNIT-IV	Metabolism	Periods: 9						
Introduction: Food chain & energy flow. Definitions - Anabolism & Catabolism. Photosynthesis: Reaction and importance. Glycolysis & TCA cycle. ATP – the energy currency of cells							CO4	
UNIT-V	Microbiology	Periods: 9						
Concept of single celled organisms. Concept of species & strains. Identification & classification of microorganisms. Virus – Definition, types, examples.							CO5	
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods: 0		Total Periods: 48		
Reference Books								
<p>1. Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M,L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd</p> <p>2. Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H. John Wiley and Sons</p> <p>3. Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company</p> <p>4. Molecular Genetics (Second edition), Stent, G. S.; and Calender, R. W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher</p> <p>5. Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C.Brown Publishers.</p>								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	1	2	-	-	-	-	-	1	-
CO2	-	-	-	-	-	1	2	-	-	-	-	-	2	-
CO3	-	-	-	-	-	1	2	-	-	-	-	-	1	-
CO4	-	-	-	-	-	1	2	-	-	-	-	-	2	-
CO5	-	-	-	-	-	1	2	-	-	-	-	-	1	-
Average	-	-	-	-	-	1	2	-	-	-	-	-	1.4	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Third		Course Category Code: PCC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA101	Fundamentals of Architecture	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Explain the definition of architecture; elements of architecture; form and space.						
	CO2	Infer the basic principles of aesthetics						
	CO3	Infer and relate the components of building circulation.						
	CO4	Infer the basic principles of architectural composition.						
CO5	Analyze the process of architectural design.							
UNIT-I	Architectural Space and Mass						Periods: 10	
Definition of architecture - Elements of architecture - Primary forms - properties of form, transformation of forms - subtractive, additive forms, organization of additive forms - Articulation of forms - Space defining elements, openings in space defining elements, spatial relationship, spatial organization.							CO1	
UNIT-II	Aesthetic Components of Design						Periods: 10	
Basic principles of design such as Proportion, scale, balance, rhythm, symmetry, hierarchy, axis with building examples.							CO2	
UNIT-III	Circulation						Periods: 9	
Components of building circulation - The building approach, the building entrance, Configuration of path, Path space relationship, Forms of circulation space - Circulation diagram for residence and restaurant.							CO3	
UNIT-IV	Principles of Composition						Periods: 9	
Involves the study of the basic principles that govern an architectural composition such as Unity, Harmony, Dominance, Fluidity, Emphasis and Contrast.							CO4	
UNIT-V	Design Process and Analysis of Building						Periods: 10	
Design process - integration of aesthetics and function - Design ideologies and philosophies of renowned architects - F. L. Wright and Le corbusier							CO5	
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods: 0		Total Periods: 48		

Reference Books

1. Francis D.K. Ching, "Architecture-Form, Space and Order", Van Nostrand Reinhold Company, New York, 2007.
2. Simon Unwin, "Analysing Architecture", Roulledge, London, 2003.
3. Pramar V.S., "Design Fundamentals in Architecture", Somaiya Publications Private Ltd., New Delhi, 1973.
4. Yatin Pandya," Elements of Space making", Mapin 2007.

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	1	-	-	1	-	-	-	1	-	1	1	-
CO2	1	-	1	-	-	1	-	2	2	1	-	1	1	-
CO3	2	-	1	-	-	1	-	-	-	1	-	2	1	-
CO4	2	-	1	-	-	1	-	2	-	1	-	3	1	-
CO5	2	-	2	-	-	2	-	2	1	1	-	2	2	-
Average	1.8	-	1.2	-	-	1	-	1.2	0.6	1.0	-	1.4	1	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Third		Course Category Code: PCC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA102	History of world Architecture	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Interpret Time line and Evolution of Settlement along the riverbeds in ancient period along Egypt and Mesopotamian valley.						
	CO2	Adopt the principles of geometry to define the aesthetics and functional aspects of a building.						
	CO3	Interpret the concepts of Greek and Latin cross adopted in church planning.						
	CO4	Analyze the structural design aspects of a church building and its implications in planning.						
CO5	Distinguish the various construction techniques adopted for the domes in church building along with its merits.							
UNIT-I	Pre-Historic period to River Valley Civilizations				Periods: 10			
Different ages of history and Evolution of Settlement--Time line and geography of human civilizations --River Valley civilizations of Nile, Tigris & Euphrates --their geographical context; their political, social, religious, cultural and economic systems; settlement patterns, dwellings and other buildings.							CO1	
UNIT-II	Greece And Rome				Periods: 10			
Origin of Greek civilization-- Evolution of the Greek temple Athena and the building of the Acropolis and Agora-- Optical illusions --Origin of Roman civilization-- Urban planning-- Parthenon Roman Temple—Roman Aqueducts.							CO2	
UNIT-III	Early Christian and Byzantine Architecture				Periods: 9			
Evolution of church forms –Greek Cross and Latin Cross—Baptistery-Basilica of S.Peter’s at Rome--Pendentives & Dome in Byzantine Architecture -Architectural Character - St. Sophia, Constantinople, St. Vitale, Ravenna							CO3	
UNIT-IV	Medieval Europe				Periods: 9			
Outline history of medieval Europe-- Art and Architecture in Medieval Europe-- Romanesque and Gothic Architecture including development of vaulting—Architectural Characteristics of Abbey Hux Hommes and Notre Dame, Paris							CO4	
UNIT-V	Renaissance In Europe				Periods: 10			
Renaissance in Europe, its causes and its various facets in society--Character and building types of Early Renaissance, High Renaissance, Mannerism, Baroque and Rococo-- Renaissance in different nations—Characteristics of St. Peter’s Rome and St. Paul’s Cathedral, London.							CO5	
Lecture Periods: 48		Tutorial Periods: - 0		Practical Periods: - 0		Total Periods: 48		

Reference Books
1. Sir Banister Fletcher, 'A History of Architecture', CBS Publications (Indian Edition), 1999
2. Pier Luigi Nervi, General Editor, 'History of World Architecture Series', Harry N. Abrams, New York, 1972
3. Vincent Scully, 'Architecture – The Natural and the Man Made', Harper Collins, 1991.
4. Ching, F. D. K., Jarzombek, M. and Prakash, V, 'A Global History of Architecture', 2nd Ed. John Wiley and Sons, 2010.
5. David Watkin, 'A History of Western Architecture', Laurence King Publishing, 2015

AAA102 History of World Architecture

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	1	-	-	2	1	-	-	-	-	1	-	-
CO2	2	1	-	-	-	-	2	-	-	-	-	-	2	-
CO3	-	3	-	-	-	2	3	-	-	-	-	3	1	-
CO4	-	1	1	-	-	3	3	-	-	-	1	3	1	-
CO5	1	2	1	-	-	3	3	-	-	-	1	3	2	-
Average	0.6	1.4	0.6	-	-	2.0	2.4	-	-	-	0.4	2.0	1.2	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department : Architecture		Programme : B.Tech(Architectural Assistantship)						
Semester : Third		Course Category Code : ESC				Semester Exam Type: TY		
Course Code	Course Name	Periods/Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA103	Solid Mechanics	3	1	0	4	25	75	100
Prerequisite:		-						
		The Course will enable the students to						
Course Outcome	CO 1	Explain the concepts of stress and strain						
	CO 2	Determine the moment of inertia and section modulus						
	CO 3	Determine the Shear force and Bending moment for beams						
	CO 4	Determine the Bending stresses in beams						
	CO 5	Solve the forces in the truss members						
UNIT - I	Stresses and Strains					Periods : 12		
Elasticity - stress & strain - Types of stresses - elastic limit – Hooke's law - modulus of elasticity (young's modulus) - deformation of a body due to force acting on it - stresses in composite bars - relation between elastic constants. Introduction to strain energy							CO1	
UNIT - II	Geometrical Properties of sections					Periods : 13		
Centroid – center of gravity of simple figures – C.G. by geometrical considerations – solid bodies – C.G. with cut out holes – moment of inertia – theorems of M.I. of parallel & perpendicular axes – M.I. of a circular section, hollow section – M.I. of composite sections – modulus of section.							CO2	
UNIT – III	Shear Force and Bending Moment					Periods : 13		
Beams & support conditions – types of supports, shear force and bending moment diagrams for simply supported beams, cantilevers, and overhanging beams with concentrated, uniformly distributed loads.							CO3	
UNIT – IV	Bending Stresses in Beams					Periods : 13		
Theory of simple bending – stress distribution at a cross section due to bending moment and shear force - moment of resistance – bending stresses in sections							CO4	
UNIT – V	Pin Jointed Frames					Periods : 13		
Statically determinate plane trusses, perfect and Imperfect frames - Deficient & Redundant frames - analytical methods for finding out the forces - method of joints.							CO5	
Lecture Periods : 48		Tutorial Periods : 16			Practical Periods : --		Total Periods:64	
Reference Books:								
1. Bhavikatti. S.S., Strength of Materials, Vikas Publishing House (P) Ltd., New Delhi, Second Edition, 2012.								
2. Vazirani & Ratwani, "Analysis of Structures", Khanna Publishers, New Delhi, 1996.								
3. Punmia. B. C., Jain, A. K., and Jain, A. K., Strength of Materials and Theory of Structures, Vols. I & II, XI Edition, Laxmi Publications (P) Ltd, New Delhi, 2002								
4. Shah. H.J. and Junnarkar S.B., Mechanics of structures- Vol. I, Charotar Publishing house, Ltd., 2012.								
5. Surendra Singh, Strength of Materials, Vikas Publishing House, 2013								
6. R. Subramaniam, Strength of Materials, Oxford University Press. 2012								
7. Rattan, S.S., Strength of Materials, Tata McGraw-Hill, 2011.								
8. Khurumi, "Strength of Materials & Mechanics of Structures", Standard Publishing co. Ltd., New Delhi, 1996.								
9. R.K Bansal., Strength of materials, Laxmi Publications, New Delhi, 2012az								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	1	2	-	-	-	-	-	-	-	2	-
CO2	3	1	1	1	-	-	-	-	-	-	-	-	2	-
CO3	3	1	1	1	2	-	-	-	-	-	-	-	2	-
CO4	3	1	1	1	2	-	-	-	-	-	-	-	2	-
CO5	3	1	-	1	2	-	-	-	-	-	-	-	2	-
Average	2.8	1.0	0.8	1.0	1.6	-	-	-	-	-	-	-	2.0	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Third		Course Category Code: PCC				Semester Exam Type:- TY		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA104	Building Services-I	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Assess the impact of infra structure facilities in defining the functional aspects of a building.						
	CO2	Assess the qualitative and quantitative aspects of water for its usage for habitation.						
	CO3	Provide a required drainage system and disposal mechanism adopted for the solid waste for a building.						
	CO4	Design and execute a rain water harvesting system for a building to restore the subsoil water.						
CO5	Integrate the fire safety measures in the design of buildings.							
UNIT-I	Introduction on Building Services					Periods: 9		
Introduction to Building Services – Basics of (MEP) Mechanical, Electrical and Plumbing in a Building - Mechanical – Introduction to Heating, Ventilation & Air Conditioning and Fire Fighting Services – Electrical – Introduction to Electrical Services and Artificial Lighting Systems – Plumbing – Introduction to Water Supply and Sanitation, Waste Management – Rain Water Harvesting Systems.								CO1
UNIT-II	Water Supply					Periods: 10		
Sources of Water – Quantity of Water- Quality of Water – Requirements of Water for various purposes – Water Supply System – Water Distribution Systems – Water Supply Service Connections – Water Supply at Site & Building Level – Sources of Water at Site Level – Treatment of Water - Storage of Water – Basics of Plumbing – Water Supply -Plumbing at Site Level and Building Level as per NBC and IS Specifications & Recommendations.								CO2
UNIT-III	Sanitation					Periods: 10		
Introduction to Sanitation – Refuse – Sanitation – Plumbing at Building Level and Site Level as per NBC and IS Specifications & Recommendations – Sanitary Plumbing Systems in Building – Introduction to Sewerage Layout – Sanitary Service Connections – Introduction to Plumbing Fittings and Sanitary Fittings such as Pipe , Taps, Valves, Pumps & Motors, Water Closets, Urinals and other accessories – Reuse of Waste – Treatment of Sewage - Planning and Design Consideration of Kitchen, Toilets, Bathrooms as per NBC and IS Specifications.								CO3
UNIT-IV	Rain Water Harvesting					Periods: 9		
Introduction to Rain Water Harvesting – Need and Importance of Rain Water Harvesting in Buildings - Rain Water Harvesting Systems at Site Level and Building Level – Treatment of Water – Storage of Water – Planning and Design Consideration for Rain Water Harvesting in Multi-Storied Buildings--Introduction to Plumbing Layout with Case Study explaining the Water Supply Layout, Sewerage Layout & Rain Water Harvesting Layout.								CO4

UNIT-V	Fire Safety Regulation in Buildings			Periods: 9
Fire safety – Causes & Effects of Fire – Types of Fire – Components of Fire safety Systems – Fire Stairs, Fire Lifts etc. – Fire Detection and Firefighting Systems – Automatic Sprinkler systems— Fire Alarms- -Fire Extinguishing Systems – Planning and Design Consideration of Components of Building as NBC and IS Specifications & Recommendations- Introduction to Fire Safety Layout with Case Study.				C O 5
Lecturer Periods: 48	Tutorials Periods: -	Practical Periods: -	Total Periods: 48	
Reference Books				
<ol style="list-style-type: none"> 1. S.C.Rangwala, Water Supply and Sanitary Engineering, Charotar Publishing House, Anand 388601.1989 2. Handbook for Building Engineering in Metric Systems, NBC, New Delhi,1968 3. Manual of Water Supply and Treatment, Second Editions, CPHEEO, Ministry of works and Housing. New Delhi1977 4. Elements of Public Health Engineering by K N Duggal 5. Practical Handbook of Public Health Engineering by Er. G S Bajw 				

AAA104 Building Services-I

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	1	2	1	3	2	1	-	1	-	1	2	-
CO2	2	2	3	3	2	3	3	3	-	2	2	3	2	2
CO3	2	2	3	3	1	3	3	3	-	2	2	3	2	-
CO4	2	-	-	1	-	3	3	3	-	2	-	3	2	2
CO5	2	-	2	2	1	3	2	1	-	1	-	2	2	2
Average	2.0	0.8	1.8	2.2	1.0	3.0	2.6	2.2	-	1.6	0.8	2.4	2	1.2

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture				Programme : B.Tech (Architectural Assistantship)					
Semester: Third				Course Category Code: PCC		Semester Exam Type:- LB			
Course Code	Course	Periods/ Week			Credit	Maximum Marks			
		L	T	P	C	CA	SE	TM	
AAA105	Basic design	0	0	6	3	25	75	100	
Prerequisite		--							
Course Outcome		The Course will enable the student to							
		CO1	Examine the qualities of different elements as well as their composite fusions.						
		CO2	Choose the apt colour scheme according to the characteristics of any designed space or built-up environment.						
		CO3	Design and create model for innovative forms based on a theme or concept.						
		CO4	Design and create craft works, sculpture and murals for an ambiance in a campus or built environment.						
		CO5	Analyze building forms in terms of visual character, form and function, play of light and shade, solids and voids, colors and texture.						
The course shall be conducted by giving a number of exercises in the form of Design studios, Seminars and Creative workshops that are aimed at teaching the following:									
UNIT-I	Elements and Principles of Design					Periods: 20			
Elements and Principles of Visual Composition and Pattern making.						CO1			
UNIT-II	Colour and its Applications					Periods: 18			
Exploring Color theories and their application in a Visual composition - Study of texture and schemes of texture both applied & simulated and their application.						CO2			
UNIT-III	Forms and models					Periods: 20			
Material and Form / Structures – Nature based enquiry into form both Linear and Planar, fluid and plastic forms using simple material like Mount Board, metal foil, box boards, wire string, thermocol, clay, plaster of Paris etc.						CO3			
UNIT-IV	Solids and Voids					Periods: 20			
Study of Solids and voids to evolve sculptural forms and spaces using specific process oriented methods like casting, moldings etc.,						CO4			
UNIT-IV	Visual Characteristics - Light, Colors and Texture					Periods: 18			
Analytical appraisal of building form in terms of visual characteristics: form and function, play of light and shade, colors and texture.						CO5			
Lecture Periods: 0		Tutorial Periods: 0		Practical Periods: 96		Total Periods: 96			
Reference Books									
1. Francis D.K. Ching, "Architecture-Form, Space and Order", Van Nostrand Reinhold Company, New York, 2007. 2. Pramdar V.S., "Design Fundamentals in Architecture", Somaiya Publications Private Ltd., New Delhi, 1973. 3. Owen Cappleman & Michael Jack Jordon, "Foundations in Architecture: An Annotated Anthology of Beginning Design Projects", Van Nostrand Reinhold New York, 1993. 4. Charles Wallschlaggerm & Cynthia Busic-Snyder, "Basic Visual Concepts and Principles for Artists, Architects and Designers", McGraw Hill, New York 1992.									

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	1	1	-	3	-	-	c	1	-	1	1	-
CO2	1	-	1	1	-	-	-	-	-	1	-	1	1	-
CO3	1	1	1	1	-	2	-	-	-	1	-	2	2	-
CO4	1	-	1	1	-	2	-	-	-	1	-	3	1	-
CO5	1	1	1	1	-	2	-	2	-	1	-	3	3	-
Average	1.0	0.6	1.0	1.0	-	1.8	-	0.4	-	1.0	-	2.0	1.6	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture				Programme : B.Tech (Architectural Assistantship)				
Semester: Third				Course Category Code: ESC		Semester Exam Type:- LB		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA106	Architectural Graphics	0	0	3	1.5	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Relate the concepts of Architectural drawing as well as their representation						
	CO2	Interpret the building representation in 2D Planar surface and Multi View Projection Drawings of Solids						
	CO3	Compare Architect's Sketches translated as Drawing systems through Pictorial Systems						
	CO4	Perceive Isometric and Axonometric Detailed Drawings						
CO5	Compare the building scale with drawings and create measured drawing of an existing building.							
UNIT-I	Geometrical Drawing and Rendering				Periods: 10			
Construction of planar surface – square, rectangle, polygon - Exercise with Straight line, curvilinear line, Planes, Volume and Texture to understand various forms in Nature and Manmade forms Freehand Sketching Exercise to understand the Characteristic of Elements in Nature and Manmade forms - Basic Knowledge of Scale, Proportion, Light and Shade.								CO1
UNIT-II	Geometrical Drawing: Isometric and Axonometric projection				Periods:09			
Isometric, projection of planes, solids and combination of solid etc.- Architectural details like pergolas, Simple Axonometric drawings - Addition of solids and voids that will create more 3-dimensional expression								CO2
UNIT-III	Two Point Perspective View of Buildings				Periods:09			
Construction of Two point perspective grid- Exercise on Two point Perspective of building Exterior by Direct projection Method / Approximate Method. Exercise on Two point Perspective of building exterior by Direct projection Method / Approximate Method..								CO3
UNIT-IV	One Point Interior Perspective and Sciography				Periods:10			
Construction of One point perspective -Exercise on One point Interior view of any room viz Bed Room, Kitchen, Drawing room etc. by Direct projection Method (a) Principles of Shades and shadows - Techniques of drawing shades and shadows solids and Architectural Building Elements								CO4
UNIT-V	Measured drawing of single storied building(s)				Periods: 10			
To measure and draw the Ground Floor Plan along with plot boundaries, four side elevations, two sections, block plan, site plan of existing single storied building (maximum of 100.0 sq. mtrs. Plinth Area).								CO5
Lecture Periods: 0		Tutorial Periods:0		Practical Periods:48		Total Periods:48		

Reference Books

1. IH. Morris, Geometrical Drawing for Art Students - Orient Longman, Madras, 2004.
2. Francis D. K. Ching, Architectural Graphics, John – Wiley and Sons, 2009.
3. Fraser Reekie, Reekie's Architectural Drawing, Edward Arnold, 1995
4. Robert W.Gill, "Perspective From Basic To Creative", Thames and Hudson, London, 2006
5. Francis D.K Ching, "Architectural Graphics- Fifth Edition", John Wiley and Sons, New Jersey, 2009.
7. John Montague, "Basic perspective Drawing A Visual Approach", John Wiley and Sons, New Jersey, 2009.
8. Milind Mulick, "Perspective", Jyotsna prakashan, 2006
- . Ernest Norling, "Perspective Made Easy", Dover publications, 1999
6. M.G. Shah & C.M. Kale, "Principles of Perspective Drawing", Asia publishing House, 1965

AAA106 Architectural Graphics

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	2	-	-	-	-	-	2	2	-
CO2	-	2	-	-	-	1	-	-	-	-	-	1	3	-
CO3	-	2	-	-	-	2	-	-	-	-	-	3	2	-
CO4	2	2	1	-	-	2	-	-	-	-	-	3	3	2
CO5	2	-	2	-	-	2	-	-	-	-	-	3	2	2
Average	0.8	1.2	0.6	-	-	1.8	-	-	-	-	-	2.4	2.4	0.8

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture				Programme : B.Tech (Architectural Assistantship)				
Semester: Third				Course Category Code: PCC		Semester Exam Type:- LB		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA107	Building construction and Detailing - I	0	1	3	2	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Infer construction details pertaining to brick through drawing and literature study.						
	CO2	Infer construction details pertaining to stone through drawing and literature study.						
	CO3	Relate to the properties and uses of mud as a basic building material.						
	CO4	Relate to the properties and uses of lime as a basic building material.						
	CO5	Relate to the properties and uses of bamboo as a basic building material.						
UNIT-I	BRICK MASONRY						Periods: 14	
Visual and physical quality of bricks - Exercises on basic types of bonds - Exercises on types of closures & joints - Exercises on different types of brick masonry walls - Exercises on mortar, plastering, pointing and finishes for brick masonry - Exercises on brick masonry in foundation, walls, piers, columns, arches and lintels - Exercises on masonry integrated elements such as openings, cornices and copings using brick.							CO1	
UNIT-II	STONE MASONRY						Periods: 13	
Stone in building construction - sources, characteristics selection, seasoning, dressing, testing, deterioration, preservation and durability of stone - Exercises on different types of stone masonry walls - Exercises on mortar, plastering, pointing and finishes for stone masonry - Exercises on stone masonry in foundation, walls, piers, columns, arches and lintels - Exercises on masonry integrated elements such as openings, cornices and copings using stones - Exercises on structural use of stone for beams and slabs.							CO2	
UNIT-III	MUD FOR STRUCTURAL USE AND FINISHES						Periods: 13	
Mud as basic material for construction - Mud plaster and mortar - Types of soil and soil stabilization - Mud products like adobe and compressed stabilised earthen blocks - Exercises on foundation and plinth details using adobe and compressed stabilised earthen blocks - Exercises on mud wall construction details – cob, rammed earth, wattle and daub - Exercises on damp and weatherproofing details of mud structures - Exercise on mud flooring.							CO3	
UNIT-IV	LIME FOR STRUCTURAL USE AND FINISHES						Periods: 12	
Lime as basic binding material/mortar - Extracting, slaking, hardening, storage, precautions in handling - Lime putty - Exercises on mortar, plastering, pointing and finishes using lime.							CO4	
UNIT-V	BAMBOO FOR STRUCTURAL USE AND FINISHES						Periods: 12	
Bamboo- anatomy, properties, strength, processing, harvesting - Working with bamboo - Treatment, preservation and uses of bamboo - Exercises on Joints in Bamboo - Exercises on Framed construction for walls and floors - Exercises on construction of roofs with bamboo.							CO5	
Lecture Periods: 0		Tutorial Periods: 16		Practical Periods: 48		Total Periods: 64		
Reference Books								
1. Arora S.P. and Bindra S.P., "Text book of Building Construction", Dhanpat Rai & Sons, New Delhi, 2012.								
2. Klans Dukeeberg, "Bambus – Bamboo", Karl Kramer Verlag Stuttgart Germany, 2000.								
3. National Building Code of India 2005- Part 6 Structural Design- Section 3 Timber and Bamboo.								
4. Francis D.K. Ching, "Building Construction Illustrated" John Wiley & Sons, 2014.								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	-	1	-	1	2	-	-	2	-	1	2	2
CO2	2	1	-	-	-	1	2	2	-	1	2	1	2	2
CO3	1	1	-	1	-	2	1	-	-	1	1	2	1	1
CO4	2	1	-	1	-	1	2	2	-	1	1	3	2	2
CO5	-	1	-	2	-	2	1	-	-	1	-	3	1	1
Average	1.4	1.0	-	1.0	-	1.4	1.6	0.8	-	1.2	0.8	2.0	1.6	1.6

Mapping Correlation	Low	Medium	High
	1	2	3

IV SEMESTER

Department : Architecture		Programme : B.Tech(Architectural Assistantship)						
Semester : Fourth		Course Category Code : BSC				Semester Exam Type: TY		
Course Code	Course Name	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA108	Theory of Structures	3	1	0	4	25	75	100
Prerequisite:	--							
	The Course will enable the student to							
Course Outcome	CO 1	Determine the Slope and Deflection of beams						
	CO 2	Analyse the Statically indeterminate structures						
	CO 3	Determine the forces in Arches						
	CO 4	Analyse the columns						
	CO 5	Determine the influence lines						
UNIT - I	Slope and Deflection of beams					Periods : 13		
Slope, curvature of the bending beam - relation between slope, deflection & radius of curvatures, simple problems to find out slope and deflection for different loads on beams - Double integration method, moment Area method, Conjugate beam method.							CO1	
UNIT - II	Statically Indeterminate Structures					Periods : 13		
Propped cantilever beams - Reaction of prop. - Propped cantilever beams with different types of loads - sinking of the prop. Fixed beams - bending moment diagram for fixed beams - continuous beams - moment distribution method - sinking of the supports.							CO2	
UNIT - III	Arches					Periods : 12		
Theory of Arches - classification of Arches - Analysis of three hinged Arches - Bending moment diagram for given loads - Normal thrust and radial shear - Introduction to cables - Types - Bending moments & force analysis.							CO3	
UNIT - IV	Columns					Periods : 13		
Theory of columns - Types of end conditions of columns - Equivalent length of a column - Axial loads, combined bending & axial loads, Indian Standard Code recommendations - Euler's formula for long columns - Rankine's formula - Practical applications.							CO4	
UNIT - V	Influence lines and Moving loads					Periods : 13		
Moving loads and influence lines for statically determinate structures - Types of loads - combination of loads - Influence lines – Introduction.							CO5	
Lecture Periods : 48		Tutorial Periods : 16			Practical Periods : --		Total Periods: 64	
Reference Books:								
1. Bhavikatti. S. S., Structural Analysis, Vols. I & II, Vikas Publishing House (P) Ltd., New Delhi, second Edition, 2002.								
2. Punmia. B. C., Jain, A. K., and Jain, A. K., Strength of Materials and Theory of Structures, Vol. II, Eleventh Edition, Laxmi Publications, New Delhi, 2002.								
3. Punmia, B.C., "Structural Analysis", Standard Publishers Distributors, New Delhi, 1995.								
4. M.M. Ratwani and V.N. Vazirani, 'Analysis of Structures, Vol. 1', Khanna Publishers, Delhi, 2015								
5. M.M. Ratwani and V.N. Vazirani, 'Analysis of Structures, Vol. 2', Khanna Publishers, Delhi, 2015.								
6. Timoshenko, S.P. and D.H. Young, 'Elements of Strength of Materials', 5th edition, East West Press, 2011.								
7. A.R. Jain and B.K. Jain, 'Theory and Analysis of Structures', Vol. 1, Nemchand and Bros, Roorkee, 1987.								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	1	-	2	-	-	-	-	-	-	2	-
CO2	2	1	1	1	-	2	-	-	-	-	-	-	2	-
CO3	3	1	1	1	-	2	-	-	-	-	-	-	2	-
CO4	2	1	1	1	-	3	-	-	-	-	-	-	2	-
CO5	2	1	1	1	-	2	-	-	-	-	-	-	2	-
Average	2.2	1.2	1.0	1.0	-	2.0	-	-	-	-	-	-	2.0	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)							
Semester: Fourth		Course Category Code: PCC			Semester Exam : TY				
Course Code	Course	Periods/ Week			Credit	Maximum Marks			
		L	T	P		C	CA	SE	TM
AAA109	History of Indian Architecture	3	0	0	3	25	75	100	
Prerequisite		--							
Course Outcome		The Course will enable the student to							
		CO1	Interpret Time line and Evolution of Settlement along the riverbeds in ancient period along Sindh and Indus Valley.						
		CO2	Interpret the rock cut construction techniques and distinguish various spaces in a Hindu temple.						
		CO3	Distinguish the time period and impact of Dravidian temples narrating the socio-cultural aspects.						
		CO4	Distinguish the time period and impact of Indo Aryan temples narrating the socio-cultural aspects						
		CO5	Analyze and distinguish the Characteristics of Islamic Architecture of various time periods in India.						
UNIT-I	Ancient India					Periods: 9			
Indus Valley Civilization –Features of Great Bath--Culture and pattern of settlement--Impact of Aryan culture - Vedic village and the rudimentary forms of houses--bamboo and wooden construction under the Mauryan rule.							CO1		
UNIT-II	Buddhist Architecture & Evolution of the Hindu Temple					Periods: 10			
Buddhist rock cut Architecture -- stupa-- --Salient features of a Chaitya hall and Vihara, - Examples – Chaitya hall at Karli--Concept and evolution of Hindu Temple – Early shrines of the Gupta and Chalukyan periods – Cave Temples of Gupta Period—Gupta Columns--Durga Temple, Aihole and Virupaksha temple at Pattadakal.							CO2		
UNIT-III	Dravidian Architecture					Periods: 10			
Introduction on Dravidian Architecture---Orders of Dravidian Architecture--Pallavas --- Shore Temple, Mahaballipuram (Pallava Style)-- -Brihadeeswara Temple (Chola style),Tanjore –Meenakshi Amman temple, Madurai (Pandya style).							CO3		
UNIT-IV	Indo Aryan Architecture					Periods: 9			
Introduction on Indo-Aryan Style—Building Materials and construction techniques adopted for the Indo Aryan Temples---Salient features of an Indo Aryan Temple`--Characteristic features of Lingaraja Temple, Bhuvaneswar & Sun Temple, Konark .							CO4		
UNIT-V	Islamic Architecture					Periods: 10			
Imperial Style--Islamic Architecture in India-. Salient Architectural features of Qutb Minar Complex, Varieties of squinch – Alai Darwaza, Delhi--Provincial Style--Development of the provincial styles in different regions –Jami masjid, Ahmadabad – Golgumbaz, Bijapur. Mughal Style-- Development of the Mughal style – Layout of Fatehpur– The Taj Mahal, Agra – Red Fort, Delhi							CO5		
Lecture Periods: 48		Tutorial Periods: - 0		Practical Periods: 0-		Total Periods: 48			

Reference Books

1. Sir Banister Fletcher, 'A History of Architecture', CBS Publications (Indian Edition), 1999
2. Percy Brown, Indian Architecture (Buddhist and Hindu period), D.B.Taraporevala and sons, Bombay, 19832. Satish Grover
3. Percy Brown, Indian Architecture (Islamic Period), D.B.Taraporevala and sons, Bombay, 19832. Satish Grover
4. Romila Thapar, 'The Penguin History of Early India', Penguin, 2015.
5. Christopher Tadgell, 'The History of Architecture in India - From the Dawn of Civilization to the End of the Raj', Phaidon, 2002.

AAA109

History of Indian Architecture

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	1	-	-	2	3	-	-	-	-	1	-	-
CO2	-	-	-	-	-	-	1	-	-	-	-	-	-	-
CO3	1	1	1	-	-	3	3	-	-	-	1	3	2	-
CO4	1	1	1	-	-	3	3	-	-	-	1	3	2	-
CO5	1	1	1	-	-	3	3	-	-	-	1	3	2	-
Average	1.0	0.6	0.8	-	-	2.2	2.6	-	-	-	0.6	2.0	1.2	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Fourth		Course Category Code: PCC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA110	Eco-friendly building materials and construction	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Infer the Importance of Eco Friendly Planning						
	CO2	Develop awareness on various Eco friendly Building Materials						
	CO3	Plan, control and monitor construction projects with Cost Effective Construction Techniques						
	CO4	Develop knowledge on how to provide comforts in buildings in Eco friendly Manner						
CO5	Develop knowledge on cost effective sanitation, road construction and comparison.							
UNIT-I	Eco Friendly Planning						Periods: 10	
Green buildings – Components and requirements. Energy Efficient Shelters, Housing Options Today, Site Planning and Use of On-Site Resources, Smaller Houses that Utilize Space and Materials More Efficiently, Working With Nature, Better Window Planning, Balancing Energy and Aesthetic Needs.								CO1
UNIT-II	Eco-Friendly Materials						Periods: 09	
Construction materials –locally available building materials- Soil, Fly ash, Ferro cement, Lime, Fibers, Stone Dust, Red mud, Gypsum, Alternate Wood, Polymer-ADOBE, Cob Rammed Earth, Light Clay, Straw-Bale, Bamboo, Agro-Industrial Waste, Innovative Materials Developed by CBRI, SERC, Structural Properties of Alternate Building Materials, composite materials, artificial aggregates substitutes for natural conservation								CO2
UNIT-III	Cost Effective Construction Techniques						Periods: 10	
Construction Techniques-Innovative Techniques developed by CBRI, SERC for foundation, superstructure, roofing, - Rat trap bond construction, Energy Efficient roofing, Mud Technology - pre-fabricated construction techniques, advantage of pre-fabrication areas where pre-fabrication can be introduced, modular contained earth, earth bag construction. Low cost housing construction techniques.								CO3
UNIT-IV	Cost Effective Construction Equipments						Periods: 10	
Equipment-Brick moulding machine, Stabilised soil block making machine and plants for the manufacturing of concrete blocks, M.C.R. tile making machine, Roofing channel making machine, R.C.C. Chaukhat making machine.								CO4
UNIT-V	Cost effective sanitation and Road Construction						Periods: 09	
Waste water disposal system - Cost effective sanitation for rural and urban areas – Ferrocement Drains, Cost effective road materials, stabilization, construction techniques, equipment used for construction.								CO5
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods: 0		Total Periods: 48		
Reference Books								
1. K.S.Jagadish, B.U.Venkataramareddy and K.S.Nanjundarao, "Alternative Building Materials and Technologies", New Age International, 2007. 2. Osman Attmann, "Green Architecture Advanced Technologies and Materials", McGraw Hill, 2010. 3. John Wiley, "Low Energy Cooling For Sustainable Buildings", John Wiley and Sons Ltd, 2009. 4. Mili Majumdar (Ed), "Energy Efficient Buildings in India", TERI and MNES, 2001/2002 5. Eugene Eccli, "Low Cost, Energy efficient shelter for owner & builder". Rodale Press, 1976 6. https://igbc.in & http://www.grihaindia.org/								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	2	-	2	1	2	-	2	-	-	-	2	1	-
CO2	-	1	-	2	2	2	2	2	-	-	1	2	1	-
CO3	-	1	-	2	1	1	1	-	-	-	3	1	2	-
CO4	-	1	-	1	1	3	3	-	-	1	3	3	3	-
CO5	-	1	-	1	1	2	2	2	-	1	3	2	3	-
Average	-	1.2	-	1.6	1.2	2.0	1.6	1.2	-	0.4	2.0	2.0	2.0	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture				Programme : B.Tech (Architectural Assistantship)				
Semester: Fourth				Course Category Code: PCC		Semester Exam Type:- TY		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA111	Site surveying and planning	3	0	0	3	25	75	100
Prerequisite		--						
Course Outcome	The Course will enable the student to							
	CO1	Develop sensitivity towards aspects of site at macro and micro contexts.						
	CO2	Make use of a site's potential to design the built environment.						
	CO3	Examine, analyze and plan a particular site for a specific purpose.						
	CO4	Infer a site layout and development.						
CO5	Develop a detailed site analysis, schematic site layout and development.							
UNIT-I	Introduction to site and site surveying						Periods: 10	
Definitions - Plot, site, land and region - Units of measurements - Introduction to survey and need for surveying - Methods of surveying and context of use - Chain survey and Triangulation – instruments used, method of survey and plotting into survey drawing - Plain table, Compass and theodolite surveys - Modern surveying Instruments such as EDMs and Total Stations and their application - Introduction to marking plans, layout plans and centerline plans.							CO1	
UNIT-II	Site analysis						Periods: 10	
Site potential/ limitations to architectural design - Importance of site analysis - Onsite and off-site factors - Analysis of natural, cultural and aesthetic factors - Factors - Topography, hydrology, soils, vegetation, climate and microclimate, surface drainage, accessibility, size and shape, infrastructure, sources of water supply and means of disposal system, visual aspects, context of built environment - Detailed analysis - Contours, slope analysis, grading process, grading criteria, functional and aesthetic considerations.							CO2	
UNIT-III	Site context and regulations						Periods: 10	
Detailed understanding of context of the site - Introduction to master plans, land use for cities, development control rules - Site selection criteria for different building typologies - Impact of building developments on the surroundings including aspects such as traffic, noise, pollution, microclimate, etc., especially in the context of large-scale projects.							CO3	
UNIT-IV	Principles of site layout and development						Periods: 09	
- Organization of pedestrian and vehicular circulation - Geometric calculation for movement Types of roads, hierarchy of roads, networks, road widths and parking regulations - Principles of positive drainage and grading for drainage. Location of utility lines to simplify maintenance - Planning for rain water harvesting - Incorporation of services such as drinking water pipelines, fire hydrants, communication and networking facilities at site.							CO4	
UNIT-V	Exercise in site surveying and planning						Periods: 09	
- Application of all the knowledge gained in previous units through a real/ hypothetical project involving a real site. The process would involve choosing site for a building typology or vice versa, field exercise in measuring and drawing the site, detailed site analysis, schematic site layout and development - The project will be explored through analysis/ sketches/ drawings.							CO5	
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods: 0		Total Periods: 48		
Reference Books								
1. Kevin Lynch, "Site Planning", Third Edition, MIT Press, 1984. 2. Edward. T. White, "Site Analysis", Archi Basic Press, 2014. 3. B.C.Punmia et al, "Surveying Vol.I", Seventeenth Edition, Laxmi Publications, 2016.								

AAA111

Site Surveying And Planning

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	-	1	-	1	2	-	-	2	-	1	2	2
CO2	2	1	-	-	-	1	2	2	-	1	2	1	2	2
CO3	1	1	-	1	-	2	1	-	-	1	1	2	1	1
CO4	2	1	-	1	-	1	2	2	-	1	1	3	2	2
CO5	-	1	-	2	-	2	1	-	-	1	-	3	1	1
Average	1.4	1.0	-	1.0	-	1.4	1.6	0.8	-	1.2	0.8	2.0	1.6	1.6

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Fourth		Course Category Code: PCC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA112	Building Services-II	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Prepare an electrical layout for a building by showing the components and power distribution pattern.						
	CO2	Integrate the lift and escalators in the design of a multi storied building.						
	CO3	Prepare a lighting scheme for a building based on its functional and aesthetical needs.						
	CO4	Integrate passive design techniques and mechanical devices to attain comfort conditions for the built spaces.						
CO5	Incorporate the building automation system and surveillance system in the building proposals.							
UNIT-I	Electrical Services					Periods: 10		
Basics of Electrical Services - Service Connection – Single Phase and Three Phase Supply – Components of Service Connection – Transformer, Substations, Main Distribution Boards, Switch Gears- Protective Devices, Earthing – Wiring Systems – Under Ground Cabling at Site Level Earthing and its significance-- Distribution Systems in a Building– Lightning Protection – Electrical layout of a typical residential building						CO1		
UNIT-II	Mechanical Services					Periods: 10		
Definition – Location – Sizes –Component of Elevators)– Different types of Elevators – Freight elevators, Passengers elevators, Hospital elevators – Escalators – Locations and Functions– Advantages of Escalators.						CO2		
UNIT-III	Artificial Lighting Systems					Periods: 9		
Units of measurement – Lux, candela, Luminous flux - Types of lighting --Natural and Artificial Lighting – Requirements of good lighting – Day light factors – Day light Penetration – Aims of good lighting –Principles of openings to afford good lighting. Level of Illumination for different functions (general)- Light fittings –Fluorescent bulbs, Mercury Vapor lamps, Energy Efficient lighting. (CFL, LED)						CO3		
UNIT-IV	Ventilation and Air Conditioning (HVAC)					Periods: 10		
VENTILATION: Definition – Necessity- Comfort conditions (Factors affecting ventilation-temperature control, humidity control, air filtration)– Types of ventilation (Natural & Mechanical ventilation in buildings) AIR CONDITIONING: Definition – Purpose – Principles of air conditioning (Temperature control, Air velocity control, Humidity control, control of purity of air) – Air Conditioning Systems– Types of air cleaners (Filters, Spray washers, Electric precipitators) – Types of Air Conditioners (Central type, Window Type &Split unit) - air conditioning layout for an auditorium & conference hall.						CO4		

UNIT-V	Communication Lines, Telephone Lines & IT Networks and Security Systems	Periods: 9
<p>Basics of Communication Lines, Telephone Lines & IT Networks Supply and Distribution at Site Level and Building Level</p> <p>Introduction on building security system – need for safety and security systems – security systems –access control and perimeter protection – intruder alarms – CCTV cameras - Types - Dome cameras - Wall cameras - Hidden cameras --components of CCTV system – uses in residential buildings. Introduction to building automation - Functions of Building Management Systems – Benefits of BMS.</p>		CO5
Lecturer Periods: 48	Tutorials Periods: - 0	Practical Periods: -0
Total Periods: 48		
Reference Books		
<ol style="list-style-type: none"> 1. Derek Philips, Lighting in Architectural Design, McGraw Hill, New York, 1964. 2. Aly S. Dadras, Electrical Systems for Architects, Mc Graw-Hill, Jan-1995 3. National Building Code of India 4. "A.K. Mittal"-“Electrical and Mechanical Services in High Rise Building: 5. Refrigeration and Air Conditioning by R S Khurmi 		

AAA112 Building Services-II

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	2	3	2	-	-	1	-	2	2	2
CO2	3	2	2	2	3	3	1	-	-	-	-	2	2	2
CO3	3	2	3	2	3	3	3	-	-	-	-	2	2	2
CO4	3	2	2	2	3	3	3	-	-	-	-	2	2	2
CO5	2	2	1	1	2	2	2	-	-	3	-	2	2	2
Average	2.8	2.2	2.0	1.8	2.6	2.8	2.2	-	-	0.8	-	2.0	2.0	2.0

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Fourth		Course Category Code: PCC			Semester Exam Type:- LB			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA113	Architectural Design- I	0	0	6	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Interpret the activities and its spatial requirement for a single room space or building						
	CO2	Analyse the anthropometric aspects in a single room design						
	CO3	Choose and infer the data in the context of a design						
	CO4	Create the design of a single room as per the desire of a client						
	CO5	Design the barrier free environment						
UNIT-I	Design Aspects of a Single Room						Periods:9	
The problems involve simple space organization Starting with single space single use – small span Horizontal movement – single bay – passive energy type spaces.							CO1	
UNIT-II	Anthropometric study of a single room design						Periods:9	
The study of space standards and an anthropometrics related to each problem is stressed upon. Anthropometry as related to physically handicapped and elderly persons is required to be studies.							CO2	
UNIT-III	Literature and Data Collection-Single Room Design						Periods:10	
Literature study & data collection -- space standards and activity pattern of single room space like Kitchen, Bedroom and Living Hall of a residence --Dormitory to accommodate three persons in a hostel							CO3	
UNIT-IV	Design phase – Concept and Schematic stage of a Single Room						Periods:9	
Design of a Single room—Bedroom, Kitchen, Living Hall and Dormitory							CO4	
UNIT-V	Design of Barrier free Environment -Toilet						Periods:11	
Literature study and Data collection for a barrier free toilet---Design of barrier free toilet							CO5	
Lecture Periods:0		Tutorial Periods:0		Practical Periods:48		Total Periods:48		
Reference Books								
1. Amos Rapoport, 'House, Form and Culture', Prentice Hall,1969. 2. Bernard Rudofsky, 'Architecture without Architects', MoMA, 1964. 3. Rajendra Kumar Sharma, 'Rural Sociology', Atlantic,2011. 4. Joseph De Chiara, Michael J Crosbie, 'Time Saver Standards for Building Types', McGraw Hill Professional2001.								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	2	-	-	2	2	-	-	-	-	2	3	-
CO2	-	2	2	-	-	1	3	-	-	-	2	1	3	-
CO3	-	2	2	-	-	2	2	-	-	-	-	3	3	-
CO4	2	2	1	-	-	2	3	-	-	-	2	3	3	-
CO5	2	-	2	-	-	2	2	-	-	-	2	3	3	3
Average	0.8	1.2	1.8	-	-	1.8	2.4	-	-	-	1.2	2.4	3.0	0.6

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture			Programme : B.Tech (Architectural Assistantship)					
Semester: Fourth			Course Category Code: PCC			Semester Exam Type: -LB		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA114	Building Construction and Detailing-II	0	1	3	2	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Develop drawings on timber and timber products in building construction components with details						
	CO2	Illustrate the application of Steel in building construction components and develop drawings with details						
	CO3	Illustrate the application of Aluminium in building construction components and develop drawings with details						
	CO4	Explain the suitability of different materials such as plastics, glass, and their application in building construction.						
	CO5	Explain techniques & details of damp proofing, thermal proofing and sound proofing in building construction						
UNIT-I	TIMBER AND TIMBER PRODUCTS						Periods: 14	
TIMBER - Types of timber – physical properties – seasoning, conversion, defects – decay and preservation of timber –TIMBER PRODUCT – Plywood – block, particle and Fibre board. Drawings with details on types of wooden joineries: windows (panelled & glazed), doors (panelled, flush & laminated) and ventilators (louvered). Drawings of Timber partition. Sketches of Timber furniture using plywood.							CO1	
UNIT-II	Ferrous Metal – Steel In Building Construction						Periods: 14	
Ferrous Metal- STEEL- Introduction to steel as a building material, Market form of steel and steel sections. Types of Steel joints and connections -Steel joist - Fabrication & erection. Drawings in: Steel doors, Steel framed windows (Open-able and fixed), Grills and Gates, Design of Steel Grills. Sketches in: Steel Collapsible gates and Steel Rolling Shutters. Drawings of: types of Steel roof truss, detailing of any one steel roof (King post / Queen post truss)							CO2	
UNIT-III	Non Ferrous Metal- Aluminium						Periods: 12	
Non Ferrous Metal- ALUMINIUM- Introduction to aluminium as a building material and Aluminium Alloys, Market forms of Aluminium -extrusions, foils, castings, sheets, etc.- Aluminium partitions, false ceiling, Roof finishing. Sketches of: Aluminium Sections in Aluminium Construction. Aluminium doors – open-able, sliding, pivoted; Aluminium windows- open-able, sliding, fixed, and pivoted, Aluminium ventilators – top hung, pivoted, louvered. Aluminium partitions, False ceiling with Aluminium Sections.							CO3	
UNIT-IV	Plastics, Curtain Walls And Glazing, Cladding						Periods: 12	
PLASTICS - Types of plastics – thermo plastics and thermo setting – PVC, FRP, GRP of plastics in building industry – PVC conduit- electrical and plumbing– roofing sheets – doors and windows. CURTAIN WALLS AND GLAZING - Glass – properties and application. Cladding of masonry walls – types and application. Drawings of Construction details of curtain walls – components and fixing details. Drawings of Construction details of structural walls – components, erection and fixing.							CO4	
UNIT-V	Treatments : Damp Proofing, Thermal And Acoustical Insulation						Periods: 12	
Damp proofing and water proofing – causes and effects of dampness in buildings – material used for Damp proof. Principles of Damp proofing - Detail study through drawing the application of damp proofing and water proofing for Basement floors, swimming pools and terraces in today's context. Drawings of DPC at plinth, lintel and roofs. Thermal insulation – materials used -construction details through drawings – floors, wall and roofs – cold storage – Acoustical insulation - materials used - construction details through drawings – floors, wall and roofs – Acoustic Insulation – Techniques - Sound Recording studio – construction details.							CO5	
Lecture Periods: 0		Tutorial Periods: 16		Practical Periods: 48		Total Periods: 64		

Reference Books

1. Arora S.P. and Bindra S.P., "Text book of Building Construction", DhanpatRai & Sons, New Delhi, 2012.
2. S.C.Rangwala, "Engineering Materials", Charotar Publishing House Pvt. Limit
3. Francis D.K. Ching, "Building Construction Illustrated", John Wiley & Sons 2000.
4. B.C. Punmia, "Building Construction", Lakshmi Publications Pvt. Ltd., N.Delhi.
5. W.B.Makay, "Building Construction Vol I & II", Vol.1,2,3 Longmans, U.K.1981

AAA114

Building Construction and Detailing-II

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	1	1	-	1	2	-	-	1	-	3	3	-
CO2	2	-	1	-	-	1	2	2	-	1	2	3	3	-
CO3	1	-	2	1	-	1	1	-	-	1	1	3	3	-
CO4	2	-	1	1	-	1	2	2	-	1	1	3	3	-
CO5	-	-	2	2	-	1	1	-	-	1	-	3	3	-
Average	1.4	-	1.4	1.0	-	1	1.6	0.8	-	1.0	0.8	3.0	3.0	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Fourth		Course Category Code: ESC				Semester Exam Type:- LB		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA115	Computer Applications in Architecture I	0	0	3	1.5	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Interpret the various menu of the CAD software and its utilization in preparing a drawing.						
	CO2	Create single room plan with furniture, doors, windows & dimensional specifications using layers.						
	CO3	Utilize layers and layout in CAD to obtain the drawings in desired formats.						
	CO4	Take the printout of CAD drawing in desired paper sizes and scale.						
	CO5	Create sections and elevations for a single storied residential building in CAD software.						
UNIT-I	Introduction on CAD and Creative Tools				Periods: 9			
Introduction on CAD interface and its System requirements—Typical features of the CAD interface—Various Menus—creative, edit tools, Annotation tools, sheet setting & plotting—Hands on experience on using Creative tools like Line, Pline, Arc, Circle and Polygon <u>Exercises:</u>								CO1
1. Creation of Basic shapes like Square, Circle, Polygon using the drawing limits. 2. Apply the hatch patterns over the shapes drawn in Exercise no:1.								
UNIT-II	Editing Tools , Annotation Tools				Periods: 10			
Features of Copy, Mirror, Erase, Trim, Fillet, Chamfer, Array and Properties—Hands on experience on using the edit tools—Dimensioning tools—Linear, Aligned & angular—Setting the Dimension Style to change the extension line, Arrow, dimension text, precision of dimension and type of dimension. <u>Exercises:</u>								CO2
3. Draw a single room plan with the application of creative and edit tools. 4. Dimensioning process for the single room plan created in exercise no:3								
UNIT-III	Creation of Layers, Model space and Paper space				Periods: 9			
Understanding the concept of Layers in drawing--- hands on experience on layer tools – creation of layer, layer Manager, properties, line type, color, on/off, freeze/thaw, plot features associated with layer. Model space and Paper space—features—Hands on experience on setting the various paper sizes using the layout wizard feature. <u>Exercises:</u>								CO3
5. Draw a plan and show the doors, furniture, dimensions and Text in different layers. 6. Set the paper space for a single room plan drawn in exercise no:5.								
UNIT-IV	Plotting features				Periods: 10			
Plot Menu—features—setting various paper sizes and assigning various plotting devices—Hands on experience to obtain printout in various scales in A4 paper of a drawing. <u>Exercises:</u>								CO4
7. Set the plotting option for a single room drawing to obtain print out in 1:100 scale on a A4 size sheet 8. Set the plotting option for a single room drawing to obtain print out in 1:50 scale on a A4 size sheet								

UNIT-V	Creation of a plan for a single bedroom residence of 100 square meters built up Area	Periods: 10		
Creation of a plan for single bedroom residence of not less than 100 square meters built up area—Plotting the same in 1:100 scale in A4 sheet. <u>Exercises:</u> 9. Draw a plan for the single bedroom residence plan of not less than 100 m ² built up Area. 10. Draw the section and elevation for the single bedroom residence drawn in exercise no:9			CO5	
Lecturer Periods: 0	Tutorials Periods: -0	Practical Periods: - 48	Total Periods: 48	
Reference Books				
1. Mastering AutoCAD 2021 and AutoCAD LT 2021, Brian C. Benton, George Omura. 2. Fiorello. J. A., 'CAD for Interiors beyond the basics', Wiley publications, 2011. 3. AutoCAD for Beginners by Cadfolks. 4. AutoCAD Tutorial First level 2D by Luke Jumper, Randy,H,Shih. 5. Residential Design using AutoCAD by Daniel John Stive.				

AAA115 Computer Applications in Architecture -I

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	3	-	-	-	2	3	-	2	1	3
CO2	-	-	-	-	3	-	-	-	2	3	-	2	1	3
CO3	-	-	-	-	1	-	-	-	2	3	-	2	1	3
CO4	-	-	-	-	2	-	-	-	2	3	-	2	1	3
CO5	-	-	-	-	3	-	-	-	2	3	-	2	1	3
Average	-	-	-	-	2.4	-	-	-	2.0	3.0	-	2.0	1.0	3.0

Mapping Correlation	Low	Medium	High
	1	2	3

Department : HSS		Programme : B.Tech. (Architectural Assistantship)						
Semester : Fourth		Subject Category: MCC				Semester Exam Type: -		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
SHA102	Indian Constitution	3	-	-	-	-	-	-
Prerequisite	--							

Course Outcome	The Course will enable the student to							
	CO1	Outline the essence and significance of the constitution.						
	CO2	Recognize the fundamental duties and rights of each individual in a society.						
	CO3	Appreciate the structure and functions of legislature, executive and judiciary						
	CO4	Explain the functioning of state governments and union territories .						
	CO5	Describe the Centre-State relations and functioning of constitutional bodies						
UNIT-I	Introduction of Indian Constitution				Periods: 10			
The Making of Indian Constitution - The Constituent Assembly - Sources of Indian Constitution - Preamble and the Supreme Court's Judgments on Preamble.							CO1	
UNIT-II	State, Rights and Duties				Periods: 10			
State and Union Territories – Citizenship - Fundamental Rights - Directive Principles of State Policy - Fundamental Duties.							CO2	
UNIT-III	Union Government				Periods: 10			
Union Government - The Powers and Functions of the President, Vice-President, Council of Ministers, Prime Minister, Judiciary, Supreme Court - Judicial Review - Judicial Activism- Public Interest Litigation - Power and Functions of the Parliament - Budget Power and Functions of Parliament, Speaker of Lok Sabha.							CO3	
UNIT-IV	State Governments				Periods: 09			
State Governments – Governor - State Council of Ministers - Chief Minister- Legislative Assembly- High Courts - Union Territories - Panchayati Raj Institutions - 73th and 74th Constitutional Amendment - Gram Panchayats - Block Panchayats - Municipalities.							CO4	
UNIT-V	Union- State Relations, Constitutional Bodies				Periods: 09			
Centre – State Relations - Public Service - Election Commission - NITI Ayog, Emergency Powers of the President- Constitution Amendment Procedure- Right to Information Act - Right to Education. Major Constitutional Amendments and their impact on Indian Political System.							CO5	
Lecture Periods: 48		Tutorial Periods: -		Practical Periods: -		Total Periods: 48		

Reference Books

1. Austin, Granville. The Indian Constitution: Cornerstone of a Nation. Oxford University Press, 1999.
2. Basu, Durga Das, et al. Introduction to the Constitution of India. 20th ed., Thoroughly Rev, Lexis Nexis Butterworths Wadhwa Nagpur, 2008.
3. Choudhry, Sujit, et al., editors. The Oxford Handbook of the Indian Constitution. Oxford University Press, 2016.
4. Bakshi, Parvinrai Mulwantrai, and Subhash C.Kashyap, The Constitution of India (Universal Law Publishing 2016)
5. Bhargava, Rajeev, 'Politics and Ethics of the Indian Constitution', 2009
6. Rajeev Bhargava - 'The Promise of India's Secular Democracy', 2010
7. Chakrabarty, Bidyut, India's Constitutional Identity: Ideological Beliefs and Preferences (Routledge, 2019)

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	1	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	1	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	1	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	1	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Average	-	-	-	-	-	1	-	-	-	-	-	-	-	-

Mapping Correlation	Low	Medium	High
	1	2	3

V SEMESTER

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Fifth		Course Category Code: PCC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA116	History of Modern Architecture	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Assess the impact of industrial revolution on an historic building in terms of material and construction techniques.						
	CO2	Integrate the impact of new building materials & trends in the design of a building.						
	CO3	Design a building based on specified characteristic features along with a concept or theme.						
	CO4	Prepare the document of an existing building based on various design aspects and climatic conditions.						
	CO5	Interpret the impact of historical aspects and technology in the design of buildings.						
UNIT-I	Introduction on Modern Architecture					Periods: 10		
<p>Neo- Classical Architecture: Neo Classical Architecture and its types.</p> <p>Industrial revolution: - Outline of Industrial Revolution and associated changes - Urban transformations in Europe and America--- Industrial material of steel, glass and concrete - New construction techniques and standardization--- Split of design education into Architecture and engineering streams - Industrial exhibitions-- Development of Skyscrapers.</p>								CO1
UNIT-II	Impact of Industrialization on Modern Architecture					Periods: 10		
<p>Reactions to industrialization in design of Building—Impact of new inventions and Modern Building materials—new Construction Techniques and Standardization--Arts and Crafts in Europe and America--- Art Nouveau --- Works of Horta, Gaudi, Guimard and Mackintosh--- Vienna Secession.</p>								CO2
UNIT-III	Evolution Of Modern Architecture - Ideologies, Movements And Styles					Periods: 9		
<p>Evolution of various Theories: Organic Architecture, Expressionism, Futurism, Constructivism, Cubism & Vernacular Architecture--Five Principles of Le Corbusier on Modern Architecture—“Form follows function” design principle of Louis Sullivan—Philip Johnson philosophies on Glass and its utilization in buildings.</p>								CO3
UNIT-IV	Modernist Architects And Their Works					Periods: 9		
<p>Modern Architecture -Contribution of Werkbund and Bauhaus, New conception of space –International style, works of Walter Gropius Works and ideas of Mies Van De Rohe and Le Corbusier—Falling Water at Pennsylvania-- Ron champ chapel by Le Corbusier</p>								CO4
UNIT-V	Modern Architecture of India—Post Independence era					Periods: 10		
<p>20TH CENTURY ARCHITECTURE – INDIA PRE INDEPENDENCE --Indo Saracenic Architecture - Rashtrapathi Bhavan, Delhi by Edwin Lutyens --Senate house-- Madras University by Robert Fellowes Chisholm</p> <p>POST INDEPENDENCE --Chandigarh master plan, High court building by le Corbusier Works of Louis – Is – Khan Kanchenjunga apartments Bombay by Charles Correa, B V Doshi – Sangath—COSTFORD –Laurie Baker</p>								CO5
Lecturer Periods: 48		Tutorials Periods: -0		Practical Periods: - 0		Total Periods: 48		

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	2	2	3	3	3	-	-	-	2	3	2	-
CO2	2	3	3	3	3	3	3	-	-	-	2	3	2	-
CO3	2	2	2	2	3	3	3	-	-	-	2	3	2	-
CO4	2	1	2	2	3	3	3	-	-	-	2	3	2	-
CO5	2	1	1	1	3	3	3	-	-	-	2	3	2	-
Average	2.0	1.6	2.0	2.0	3.0	3.0	3.0	-	-	-	2.0	3.0	2.0	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Fifth		Course Category Code: HSM			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
HSA102	Industrial Economics & Management	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Outline the industrial micro economics / macroeconomics						
	CO2	Explain various management techniques based on the needs.						
	CO3	Explain various investment evaluation based on the needs						
	CO4	Explain the steps in production, process planning, scheduling and dispatch.						
CO5	Discuss the various marketing strategy.							
UNIT-I	Micro And Macro Economics And Its Applications				Periods: 11			
Nature and Scope of Economic science: Micro – Macro Economics, Economic decisions and Technical decisions. Demand and Supply concepts: Types of Demand, Determinants of Demand and Supply, concept of Equilibrium, Elasticity of Demand, cost components, Concepts of ISO-Quant – Break Even Analysis – Market structure – Price of Product Nature of pricing in different types of competition Small Scale Industries – Role of SSI in Indian Economy. Macro Economics: Nature and functions of Money – National Income – GNP and Savings – Inflation and Deflation concept – Business Cycle – Foreign Trade and Balance of payment								CO1
UNIT-II	Management Techniques				Periods: 10			
Types and Principles of Management – Elements of Management – Planning, Organizing, Staffing, Directing, Coordinating Controlling - Scope of Management – Types of Organization Merits and Demerits – Types of (Ownership) of a firm Merits and Demerits.								CO2
UNIT-III	Industrial Finance				Periods: 9			
Need for Finance – Types of finance – Sources of finance – Types of Investment – Evaluation of Investment – Preparation of Trading, Profit and loss Account and Balance Sheet – types of accounting and significance of each types								CO3
UNIT-IV	Production Management				Periods: 9			
Theory of Production Function – Types of Production Merits and Demerits – Process Planning – Routing – Scheduling – Material Control Concepts of Productivity – Measurement of Productivity – Inspection and Dispatches								CO4

UNIT-V	Marketing Management	Periods: 9		
Core Concepts of Marketing - Needs – Wants – Demand, Marketing Vs Selling – Products and Markets – Pricing and related factors – Channels of Distribution – Promotion Advertising – Market Research Vs Marketing Research				CO5
Lecture Periods: 48	Tutorial Periods: 0	Practical Periods: 0	Total Periods: 48	
Reference Books				
1. Varshney Maheswri “Managerial Economics” S Chand & Co, New Delhi 2011 2. Dutt & Sundaram, “Indian Economy” S Chand & Co New Delhi 2015 3. Pandey I.M, “Elements of Financial Management” Wiley Eastern Ltd New Delhi 2015 4. H.L. Ahuja, “Macro Economics for Business and Management, S Chand & Company Ltd 2011 5. O.P Khanna, “Industrial Engineering and Management, Dhanpat Rai and Sons, 2009. 6. Philip B Kotler, “Marketing Management, Mac Millan, New York 2011				

HSA102 Industrial Economics & Management

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	3	-	1	-
CO2	-	-	-	-	-	-	-	-	-	-	3	-	1	-
CO3	-	-	-	-	-	-	-	-	-	-	3	-	1	-
CO4	-	-	-	-	-	-	-	-	-	-	3	-	1	-
CO5	-	-	-	-	-	-	-	-	-	-	3	-	1	-
Average	-	-	-	-	-	-	-	-	-	-	3	-	1	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department : Architecture		Programme : B.Tech(Architectural Assisftantship)						
Semester : Fifth		Course Category Code : PCC				Semester Exam Type: TY		
Course Code	Course Name	Periods/Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA117	Design of Structures -I	3	1	0	4	25	75	100
Prerequisite:	--							
	The Course will enable the student to							
Course Outcome	CO 1	Explain the concepts of limit states						
	CO 2	Design the beams using Limit State method						
	CO 3	Design the T beam using Limit State method						
	CO 4	Design the Continuous beam using Limit State method						
	CO 5	Design for shear using Limit State method						
UNIT - I	Introduction to Limit State method					Periods : 12		
Limit State Method - Concept –Advantages- Different limit states- Characteristic strength and design strength of materials – Characteristic loads and design loads - Partial safety factors for loads and material strength - Limit state of collapse in flexure – Assumptions – Stress Strain curves for concrete and steel – Stress block – Maximum strain in concrete – Limiting values of neutral axis of singly reinforced section for different grades of steel -Design stress in tension and compression steel– Moment of resistance of singly and doubly reinforced rectangular sections– Problems.							CO1	
UNIT - II	Limit State Design of Rectangular Beams					Periods : 13		
Design requirements-Effective spans of cantilever and simply supported beams – Breadth and depth requirements of beams – Control of deflection – Minimum depth requirement for stiffness – Minimum concrete cover to reinforcement steel for durability and fire resistance – Minimum and maximum areas / spacing for main reinforcement and side face reinforcement as per IS 456 -2000 - Development Length-Anchorage values of bends and hooks - Curtailment of reinforcements- Design bending moments – Design of singly and doubly reinforced rectangular beams (Cantilevers and Simply supported beams carrying udl only)- Problems							CO2	
UNIT - III	Limit State Design of T beams					Periods : 13		
Cross sections of Tee and L-beams- Effective width of flange- Neutral Axis and M.R of Singly Reinforced T-Sections- Design of singly reinforced T-beams for flexure–Problems on Simply supported T- beams carrying udl only							CO3	
UNIT - IV	Limit State Design of Continuous Beams					Periods : 13		
Methods of analysis of continuous beams- Effective Span- Arrangement of Loading for Critical Bending Moments- B.M coefficients specified by IS:456-200-Design of rectangular continuous beams (Singly and Doubly Reinforced) using B.M. coefficients (equal spans & u.d.l only) for sagging and hogging moments.							CO4	
UNIT - V	Limit State Design for Shear					Periods : 13		
Limit state of collapse in shear – Design shear strength of concrete – Design shear strengths of vertical / inclined stirrups and bent up bars –Principle of shear design – Critical sections for shear- S.F Coefficients specified by IS:456- 2000– Nominal shear stress –Minimum shear reinforcement- Design of vertical stirrups for rectangular beams using limit state method –Simple problems							CO5	
Lecture Periods : 48	Tutorial Periods : 16	Practical Periods : --			Total Periods: 64			

Reference Books:

1. Ramamrutham, S. "Design of Reinforced Concrete Structures", Dhanpat Rai & Sons, New Delhi, 1996.
2. Sinha, N.C. & Roy, S.K., "Reinforced Concrete Structures", S. Chand & Company Ltd., New Delhi, 1983.
3. Ashok. K. Jain, "Reinforced concrete structures", New Chand & Bros Roorkee, 1992.
4. .H.J. Shah, "Reinforced concrete - Vol I", Charotor Publishing House, Annand, 1994
5. Dr. B.C. Punmia, 'Reinforced Concrete Structures' Vol, 1 and 2', Laxmi Publication, Delhi, 2015.
6. S. Unnikrishnan Pillai and Devados Menon, 'Reinforced Concrete Design', Tata McGraw Hill Publishing Co. Ltd., New Delhi, 2017.
7. S.N. Sinha, "Reinforced Concrete Design", Tata McGraw Hill, 2017

AAA117

Design of Structures - I

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	2	-	2	-	-	-	-	-	-	3	-
CO2	3	2	1	2	-	2	-	-	-	-	-	1	3	-
CO3	3	2	1	2	-	2	-	-	-	-	-	1	3	-
CO4	3	2	1	2	-	2	-	-	-	-	-	1	3	-
CO5	3	2	1	2	-	2	-	-	-	-	-	1	3	-
Average	2.8	1.8	1.0	2.0	-	2.0	-	-	-	-	-	0.8	3.0	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Fifth		Course Category Code: PEC				Semester Exam Type:- TY		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA201	Elements of Interior Design	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Interpret Interior design as an integral part of architecture and as an Interdisciplinary and allied field related to architecture						
	CO2	Identify the ways in which interior spaces can be enriched through the design of specific interior components						
	CO3	Perceive interior treatment and finishes in the experience of interior spaces						
	CO4	Interpret interior elements and spaces						
	CO5	Design interior spaces.						
UNIT-I	Introduction To Interior Design				Periods: 9			
Definition and process of interior design - vocabulary of interior design in terms of principles and elements - introduction to the design of interior spaces as related to typology and function, themes and concepts.							CO1	
UNIT-II	History Of Interior and Furniture Design				Periods: 10			
Overview of interior and furniture design in the Western context through the ages relating to historical context, design movements and ideas - innovations and design ideas - furniture for specific types of interiors: office furniture, children's furniture, residential furniture, display systems etc.							CO2	
UNIT-III	Components of Interior - Interior Treatment and Finishes				Periods: 9			
Treatment of components such as floors, ceilings, walls, partitions, window treatments, accessories, etc., in terms of their choice and design related to materials, methods of construction, colour, texture, etc., based on functional, aesthetic and psychological criteria							CO3	
UNIT-IV	Components of Interior - Lighting and Landscaping				Periods: 9			
Interior lighting - different types of lighting - types of lighting fixtures- their effects and suitability in different contexts Interior landscaping elements: rocks, plants, water, flowers, fountains, paving, Artifacts, etc., their physical properties and effects on spaces							CO4	
UNIT-V	Layout Planning and Detailing				Periods: 11			
Layout of floor plan, wall panels, furniture, false ceiling, Air conditioning and Ducting - Residential Spaces and Restaurant- Develop a working drawing for interior design detailing for residential & office spaces, hotel lobbies etc.							CO5	
Lecture Periods:48		Tutorial Periods:0		Practical Periods:0		Total Periods:48		

Reference Books
1. Francis D.K.Ching, Interior Design Illustrated, V.N.R. Pub. NY 1987
2. Joseph DeChiara, Julius Panero, Martin Zelnik, Time Saver's Standards for Interior Design, McGraw-Hill Professional 2001
3. John F.Pile, Interior Design, John Wiley and Sons 2004
4. Dr.Saranya Doshi, Editor, The Impulse to adorn - Studies in traditional Indian Architecture, Marg Publications 1982
5. Steport - De - Van Kness, Logan and Szebely, Introduction to Interior Design, Macmillan Publishing Co NY 1980
6. Inca-Interior Design Register, Inca Publications, Chennai 1989
7. Kathryn B.Hiesinger and George H.Marcus, Landmarks of twentieth Century Design; Abbey Ville Press 1993

AAA201 Elements of Interior Design

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	-	-	-	-	-	1	-	-	-	-	-	2	-
CO2	-	-	1	-	-	2	2	-	-	-	-	2	3	-
CO3	2	2	1	-	1	-	3	-	-	-	2	-	2	-
CO4	1	1	1	-	-	2	3	-	-	-	-	3	3	2
CO5	1	2	1	-	2	3	1	-	-	-	2	3	2	3
Average	1.0	1.0	0.8	-	0.6	1.4	2.0	-	-	-	0.8	1.6	2.4	1.0

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Fifth		Course Category Code: PEC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA202	Vernacular Architecture	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Analyze Indian vernacular architecture as a process and get an overview of cultural and contextual responsiveness of vernacular architecture						
	CO2	Relate to the different approaches & concepts in the study of vernacular architecture						
	CO3	Examine the vernacular architectural forms of different regions of India						
	CO4	Examine the vernacular architecture of south India						
	CO5	Analyze the impact of colonial rule on the vernacular architecture in India						
UNIT-I	Introduction					Periods: 09		
Definition and classification of vernacular architecture - Vernacular architecture as a process - Methodology for survey and study of vernacular architecture - Overview of cultural and contextual responsiveness of vernacular architecture.						CO1		
UNIT-II	Approaches And Concepts					Periods: 09		
Overview of different approaches and concepts to the study of vernacular architecture - Aesthetic, architectural and anthropological studies.						CO2		
UNIT-III	Vernacular Architecture Of The Western And Northern India					Periods: 10		
Forms, spatial planning, cultural aspects, symbolism, colour, art, materials of construction and construction technique of the vernacular architecture of the deserts of Kutch and Rajasthan (including havelis of Rajasthan), rural and urban Gujarat (including wooden mansions/ havelis in general and that of the Bohra Muslims) and of Kashmir (including houseboats).						CO3		
UNIT-IV	Vernacular Architecture Of South India					Periods: 10		
Forms, spatial planning, cultural aspects, symbolism, art, colour, materials of construction and construction technique, proportioning systems, religious beliefs and practices in the vernacular architecture of Kerala (including houses of the Nair & Namboothri community, Koothambalam and Padmanabhapuram palace) and Tamil Nadu (including houses and palaces of the Chettinad region and Agraharams)						CO4		
UNIT-V	Western Influences On Vernacular Architecture Of India					Periods: 10		
Evolution of the Bungalow from the traditional 'bangla' – Victoria Villas – Planning principles, materials and methods of construction – Settlement pattern and house typologies in Pondicherry and Cochin.						CO5		
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods: 0		Total Periods: 48		
Reference Books								
1. Paul Oliver, "Encyclopedia of Vernacular Architecture of the World", Cambridge University Press, 1997.								
2. Amos Rapoport, "House, Form & Culture", Prentice Hall Inc.1969.								
3. R W Brunskill, "Illustrated Handbook on Vernacular Architecture", Faber & Faber, 1970.								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	-	1	-	1	2	-	-	2	-	1	2	2
CO2	2	1	-	-	-	1	2	2	-	1	2	1	2	2
CO3	1	1	-	1	-	2	1	-	-	1	1	2	1	1
CO4	2	1	-	1	-	1	2	2	-	1	1	3	2	2
CO5	-	1	-	2	-	2	1	-	-	1	-	3	1	1
Average	1.4	1.0	-	1.0	-	1.4	1.6	0.8	-	1.2	0.8	2.0	1.6	1.6

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Fifth		Course Category Code: PEC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA203	Energy Efficient Architecture	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Improve the performance of a building with passive design principles. Knowledge on concept and implication of passive Design concepts.						
	CO2	Interpret the features of passive heating						
	CO3	Explain the features of passive cooling.						
	CO4	Summarize the significance of daylighting and natural ventilation in design of buildings						
CO5	Infer knowledge on the trends of future and technologies to replace the conventional energy resources.							
UNIT-I	Passive Design				Periods: 10			
Definition of Passive design and its impact on architectural design--Significance of energy efficiency in the contemporary context--- Simple passive design considerations involving site conditions, building orientation, plan form and building envelope--- Heat transfer and thermal performance of walls and roofs.							CO1	
UNIT-II	Passive Heating				Periods: 9			
Direct gain--- Thermal storage of wall and roof--- Roof radiation trap--- Solarium--- Isolated gain-- Tromb wall --Geo Thermal Pumps.							CO2	
UNIT-III	Passive Cooling				Periods: 9			
Evaporative cooling--- Nocturnal radiation cooling--- Passive desiccant cooling--- Induced ventilation--- Earth sheltering--- Wind tower--- Earth air tunnels.							CO3	
UNIT-IV	Day Lighting and Natural Ventilation				Periods: 10			
Daylight factor –factors affecting daylight—Sun path diagram to read solar azimuth and altitude for a given location---Daylight analysis--Daylight and shading devices-- Types of ventilation—Natural and Artificial ventilations— Ventilation and building design							CO4	
UNIT-V	Contemporary and Future Trends				Periods: 10			
Areas for innovation in improving energy efficiency such as photo voltaic cells, battery technology, thermal energy storage, recycled and reusable building materials, nanotechnology, smart materials, energy conservation building code.							CO5	
Lecture Periods: 48		Tutorial Periods: - 0		Practical Periods: -0		Total Periods: 48		
Reference Books								
1. 'Manual on Solar Passive Architecture', IIT Mumbai and Mines New Delhi,1999. 2. Arvind Krishnan et al, 'Climate Responsive Architecture a Design Handbook for Energy Efficient Buildings', Tata McGraw Hill Publishing Company Limited, New Delhi,2001. 3. MajumdarM, 'Energy-efficient Building in India', TERI Press,2000. 4. Givoni .B, 'Passive and Low Energy Cooling of Buildings', Van Nostrand Reinhold, New York,1994. 5. Manual of Tropical Climate by Otto Konigsberger								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	-	1	1	-	-	-	-	1	2	2	-
CO2	2	3	1	1	2	2	1	-	-	-	2	3	3	1
CO3	1	2	2	3	2	1	1	-	-	-	2	2	1	-
CO4	2	2	1	2	1	2	1	-	-	-	2	2	1	-
CO5	2	1	2	2	2	2	1	-	-	-	1	2	2	1
Average	1.8	2.0	1.4	1.6	1.6	1.6	0.8	-	-	-	1.6	2.2	1.4	0.4

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Fifth		Course Category Code: PCC			Semester Exam Type:- LB			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA118	Architectural Design -II	0	0	6	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Organise, collect and assimilate knowledge in a holistic manner						
	CO2	Develop Sensitivity towards the nature and values of unselfconscious and collective design as well as the interconnectedness of human society and environment						
	CO3	Identify and analyze changes in the above.						
	CO4	Discuss future transformations and give possible/ appropriate ways to address issues, if any.						
	CO5	Develop Sensitivity in design approach in community-oriented projects with respect to context, collective values and needs						
Unit-I	Introduction on Rural Settlement					Periods: 07		
Rural settlements offer an opportunity to understand basic aspects of human built environment and what goes into its making/ influences it. The interrelationship between built form, profession, economical and socio-cultural aspects will be studied.						CO1		
Unit-II	Data Collection and Analysis on Rural Settlement					Periods: 10		
Appropriate tools and processes can be used to aid the understanding. Different methods of historical and socio-cultural study, Collection of data in the form of surveys, maps, perceptual sketches, documentation through drawings, demographic study, assimilation and analysis.						CO2		
Unit-III	Material and Construction techniques adopted in Rural Settlements					Periods: 07		
Study of specific modes of rural/vernacular/traditional Architecture including their morphology, local materials and construction technique in the context of local climate.						CO3		
Unit-IV	Master plan for a Rural Settlement					Periods: 10		
Transformations across time need are need to be studied and future developments can be evaluated and proposed for the next few years without affecting the characteristics of a rural settlement A sample design proposal accommodating the neighbourhood facilities can be incorporated for a chosen imaginary or case study rural settlement.						CO4		
Unit-IV	Design of Community building for a Rural Settlement					Periods: 14		
Design of a single or two storied building that act as a focal point for the day to day or festive activities like Community Hall or Open Market (Shopping Mall) or Panchayat Building or Cyclone shelter in the case of a costal village incorporating the passive energy techniques for its infrastructure.						CO5		
Lecture Periods: 0		Tutorial Periods: 0		Practical Periods: 48		Total Periods: 48		
Reference Books								
1. Amos Rapoport, 'House, Form and Culture', Prentice Hall,1969. 2. Bernard Rudofsky, 'Architecture without Architects', MoMA, 1964. 3. Rajendra Kumar Sharma, 'Rural Sociology', Atlantic,2011. 4. Joseph De Chiara, Michael J Crosbie, 'Time Saver Standards for Building Types', McGraw Hill Professional2001.								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	2	-	-	2	2	-	-	-	-	2	3	-
CO2	-	2	2	-	-	1	3	-	-	-	2	1	3	-
CO3	-	2	2	-	-	2	2	-	-	-	-	3	3	-
CO4	2	2	1	-	-	2	3	-	-	-	2	3	3	3
CO5	2	-	2	-	-	2	2	-	-	-	2	3	3	3
Average	0.8	1.2	1.8	-	-	1.8	2.4	-	-	-	1.2	2.4	3.0	1.2

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Fifth		Course Category Code: PCC				Semester Exam Type:- LB		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA119	Building Construction and Detailing-III	0	1	3	2	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Define the physical, engineering & structural aspects of concrete and special concretes emerging in construction field						
	CO2	Develop the structural details for various RCC building components by drawings						
	CO3	Explain the techniques of temporary structures for securing the building structures during construction						
	CO4	Explain the various systems of movements in a building and its mechanisms						
CO5	Identify the state of the art building materials developed by researchers and their application in renovation & retrofitting of structures							
UNIT-I	Introduction To Concrete and Special Concrete						Periods: 12	
Concrete and concreting – concrete ingredients – mix proportion - production process – Ready mix concrete – casting - curing – testing – uses. Special concretes – light weight, high density, fiber reinforced, polymer – constituents, preparation and uses.							CO1	
UNIT-II	R.C.C. Construction						Periods: 15	
Concept of R.C.C. – Construction techniques with R.C.C. in foundations, columns, beams, roof slabs, walls, lintel-cum-sunshade, sump, water tank. Drawings on R.C.C. construction – foundations, columns, beams, lintel-cum-sunshades, roof slabs showing Reinforcement details, Bar bending techniques & concrete casting.							CO2	
UNIT-III	Temporary Structures						Periods: 11	
Form work – Requirements of Form work – Materials for Form work – Construction of Form work for Columns, Beams and Floor Slabs – Scaffolding – Types of Scaffolding – Shoring – Types of Shoring – Underpinning- Methods of Underpinning –Centering for Arches.							CO3	
UNIT-IV	Movement Systems: Staircase, Lift And Escalator						Periods: 15	
Staircase – geometry – construction details. Drawings of R.C.C staircase – reinforcement details (Dog legged) & concrete casting. Vertical movement system – elevators or lifts – types: passenger, hospital, freight and dumb waiters – Drawings on details of lift shaft with operating mechanisms - Sketches of various types of elevators - Escalators - Drawings on details of escalator with operating mechanisms – Horizontal movement system – moving walk ways, conveyor system, and travelators.							CO4	
UNIT-V	Smart Materials And Retrofitting Techniques						Periods: 11	
Building materials and components developed by research organizations CBRI, SERC, NBO, and BMTPC. SMART MATERIALS: Smart materials – classification and components – properties – Shape memory alloy – Quantum Tunneling Composite (QTC) – CHROMO-genic material – self healing material. Techniques for renovation and retrofitting. Exercises on drafting the modern building materials & construction techniques developed by research organizations in renovation and retrofitting.							CO5	
Lecture Periods: 0		Tutorial Periods: 16		Practical Periods: 48		Total Periods: 64		

1. Arora S.P. and Bindra S.P., "Text book of Building Construction", Dhanpat Rai & Sons, New Delhi, 2012.
2. Dr. B.C. Punmia, "Reinforced Concrete Structures' Vol, 1 and 2", Laxmi Publication, Delhi, 2015
3. Francis D.K. Ching, "Building Construction Illustrated ", John Wiley & Sons 2000.
4. B.C. Punmia, "Building Construction", Lakshmi Publications Pvt. Ltd., N.Delhi.
5. S.C.Rangwala, "Engineering Materials", Charotar Publishing House Pvt. Limit
6. W.B.Makay," Building Construction Vol I & II ", Vol.1,2,3 Longmans,U.K.1981

AAA119 Building Construction and Detailing-III

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	-	-	-	2	2	-	-	1	-	2	3	-
CO2	2	-	2	1	-	2	2	2	-	1	2	2	3	-
CO3	2	-	2	1	-	2	1	2	-	1	1	2	3	-
CO4	2	-	1	1	-	2	2	2	-	1	1	2	3	-
CO5	2	-	-	2	-	2	1	-	-	1	-	2	3	-
Average	2.0	-	1.0	1.0	-	2	1.6	1.2	-	1.0	0.8	2	3.0	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Fifth		Course Category Code: ESC			Semester Exam Type:- LB			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA120	Computer Applications in Architecture II	0	0	3	1.5	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Create basic 3D objects in CAD software of any desired forms.						
	CO2	Create the composition of 3D objects to represents the building components and furniture.						
	CO3	Create building components and furniture in CAD software.						
	CO4	Apply camera and rendering options in CAD software to obtain the view. desired manner.						
CO5	Create a residential building in 3D using CAD software.							
UNIT-I	Introduction on 3D Creative Tools				Periods: 9			
<p>Creation of Basic 3D forms like Cube, Box, Cylinder, Cone and Sphere using the Modeling tools given under the DRAW pulled down Menu—Creation of 3d objects using the EXTRUSION tools of any desired 2D shapes on desired height, path and desired tapering angle.</p> <p><u>Exercises:</u></p> <ol style="list-style-type: none"> 1. Creation of Basic forms like Box, Cylinder, Cone and Sphere using the drawing limits. 2. Creation of a staircase Balustrade using the Extrusion, Revolve and Loft commands. desired 2D shape. 							CO1	
UNIT-II	UCS Applications, Edit Tools and Group Tools				Periods: 10			
<p>User Coordinate System (UCS) to set the axis of X,Y& Z in any desired orientation---World CO ordinate system (WCS) and User Coordinate System (UCS—its utilization in the creation of 3D objects</p> <p>Features of Copy, Mirror, Erase, Trim, Fillet, Chamfer, Array and Properties—Hands on experience on using the edit tools with the 3D objects—Dimensioning tools—Linear, Aligned & angular—Setting the Dimension Style to change the extension line, Arrow, dimension text, precision of dimension and type of dimension.</p> <p><u>Exercises:</u></p> <ol style="list-style-type: none"> 3. Create a Dining Table and Chair using the creative tools like Box, Cylinder and Sphere. 4. Using the copy, Array and mirror commands duplicate the chairs and arrange it around the dining table 							CO2	
UNIT-III	Creation of building components like window, sunshade, Doors, Stair with handrails				Periods: 10			
<p>Hands on experience in creating a simple building components like Window, Door and handrail of a stair.</p> <p><u>Exercises:</u></p> <ol style="list-style-type: none"> 5. Create a window of 1.2 m width and 1.35m height along with a sunshade on a wall of 3m length, 0.23m width and 3m height.. 6. Create a door of 0.9m width and 2.1 height with a sunshade 7. Create a stair with a hand rail to reach a roof of 3m height. 							CO3	

UNIT-IV	Create a single bedroom house in 3D and obtain the desired view with rendering	Periods: 9	
<p>Hands on experience to create a single bedroom house in 3D using the necessary 3D Creative, solid editing and modify tools in CAD.</p> <p><u>Exercises:</u></p> <p>8. Create a single bedroom house in 3D and obtain the rendering output using 3D Hidden mode.</p>			CO4
UNIT-V	Camera and Rendering features in CAD	Periods: 10	
<p>Use Isometric views and Camera options to obtain the desired view of a single bedroom house —Use the VIEW tool bar to obtain the desired isometric and orthographic view of the 3d objects---use the necessary tool bar to obtain the view in Wire frame/ 3D Hidden/ Rendered/ Realistic options.</p> <p><u>Exercises:</u></p> <p>9. Create a view of a single bedroom house with Camera at desired angle and distance.</p> <p>10. Obtain the rendered view of a single bedroom house using render tool.</p>			CO5
Lecturer Periods: 0	Tutorials Periods: -	Practical Periods: - 48	Total Periods: 48
<p>1. Mastering AutoCAD 2021 and AutoCAD LT 2021, Brian C. Benton, George Omura</p> <p>2. Fiorello. J. A., 'CAD for Interiors beyond the basics', Wiley publications, 2011.</p> <p>3. AutoCAD for Beginners by Cadfolks.</p> <p>4. AutoCAD 3D Modelling by PS Gill, S.K.Katara & Sons.</p> <p>5. AutoCAD Tutorial Second Level 3D Modelling by Randy h.Shih</p>			

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	3	2	2	3	-	-	-	2	3	-	1	1	3
CO2	-	2	2	2	3	-	-	-	2	3	-	1	1	3
CO3	1	3	2	2	3	-	-	-	2	3	-	1	1	3
CO4	1	3	2	2	3	-	-	-	2	3	-	1	1	3
CO5	1	3	2	2	3	-	-	-	2	3	-	1	1	3
Average	0.8	2.8	2.0	2.0	3.0	-	-	-	2.0	3.0	-	1.0	1.0	3.0

Mapping Correlation	Low	Medium	High
	1	2	3

Department : IEDC		Programme : B.Tech						
Semester : Fifth		Course Category Code: PAC			Semester Exam Type: TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		CA	SE	TM
EPA101	Entrepreneurship	3	0	0	2	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Outline the basics of Entrepreneurship and design thinking						
	CO2	Extend the knowledge to build business model and MVP						
	CO3	Outline the costing and revenue						
	CO4	Outline about marketing and sales						
	CO5	Explain about team formation and compliance requirements						
UNIT – I	Problem and Customer				Periods: 10			
Effectuation, Finding the flow. Entrepreneurial style, business opportunity, problems worth solving, methods for finding problems, problem interviews. Design Thinking, Consumer and customer, market types, segmentation and targeting, early adopters, Gains, Pains and “Jobs-To be done, Value .(Proposition Canvas (VPC), Identifying Unique Value Proposition (UVP								CO1
UNIT – II	Business Model and Validation				Periods: 10			
Types of Business Models, Lean Canvas, Risks. Building solution demo, solution interviews, problem-solution test, competition, Blue Ocean Strategy. Minimum Valuable Product (MVP)- Build-Measure-.Learn feedback loop, MVP Interviews, MVP Presentation								CO2
UNIT – III	Revenue and Cost				Periods: 9			
Revenue Streams-Income, costs, gross and net margins - Primary and secondary revenue streams-Different pricing strategies - product costs and Operations costs; Basics of unit costing. Financing .New Venture- various sources - investor expectation- Pitching to Investors								CO3
UNIT – IV	Marketing and Sales				Periods: 9			
Difference between product and brand - positioning statement. Building Digital Presence, Social media- company profile page – Sales Planning - buying decisions, Listening skills, targets. Unique .Sales Proposition (USP), sales pitch, Follow-up and closing a sale								CO4
UNIT – V	Team and Support				Periods: 10			
Team Building - Shared leadership - role of a good team - team fit - defining roles and responsibilities - collaboration tools and techniques- project management, time management, workflow, delegation .of tasks. Business regulations - Starting and operating a business - compliance requirements								CO5
Lecture Periods: 48		-Tutorial Periods: -0		Practical Periods: --0		Total Periods: 48		
Reference Books								
.Nandan H,“Fundamentals of Entrepreneurship”,Prentice Hall India,2013 .1 LearnWISE–Digital Learning platform by Wadhvani Foundation, www.Learnwise.org .2 .Khanka S.S,“EntrepreneurialDevelopment”,S Chand & Company,2007 .3 .Sangeetha Sharma,“Entrepreneurship Development”– Prentice Hall India,2017 .4 .Anil Kumar.S,“Entrepreneurship Development”– New Age Publishers, 2003 .5								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	2	3	1	2	1	-	-	2	2	-	2	-
CO2	2	3	1	3	1	1	1	-	1	2	2	-	2	2
CO3	1	-	2	2	-	2	1	-	1	2	-	-	2	-
CO4	-	-	2	3	-	2	3	2	1	3	1	-	2	2
CO5	-	2	-	2	-	3	-	-	-	2	2	2	2	2
Average	0.8	1.2	1.4	2.6	0.4	2	1.2	0.4	0.6	2.2	1.4	0.4	2	1.2

Mapping Correlation	Low	Medium	High
	1	2	3

VI SEMESTER

Department: Architecture		Programme : B.Tech (Architectural Assistantship)							
Semester: Sixth		Course Category Code: PCC			Semester Exam Type: -TY				
Course Code	Course	Periods/ Week			Credit	Maximum Marks			
		L	T	P		C	CA	SE	TM
AAA121	Urban Design	3	0	0	3	25	75	100	
Prerequisite		--							
Course Outcome		The Course will enable the student to							
		CO1	Infer the evolution and characteristics of urban forms and Inter- dependencies.						
		CO2	Discover Modern urbanism.						
		CO3	Examine urbanism through theories, aspects, issues and solutions.						
		CO4	Analyze contemporary urbanism and Urban interventions.						
CO5	Develop knowledge on ways to look at and interpret urbanism today.								
UNIT-I	Urbanism In History						Periods: 10		
		- Outline of forces shaping urbanism - Urbanism of river valley civilizations - Morphology of pre-industrial European cities to include Greek and Roman cities, medieval European towns, Renaissance urbanism and ideal cities - Outline of historic cities of India - Temple town urbanism of Tamil Nadu - Medieval cities of India - Colonial urbanism in India						CO1	
UNIT-II	Modern Urbanism						Periods: 10		
		- Industrialization and impact on urbanism - American grid iron planning - Theories, ideas and practice of good urban planning/cities/urbanism in early 20 th century. Outline of modernist cities and urbanism across the world. Morphology of Indian modernist cities - Chandigarh, Bhuvaneshwar and Gandhi Nagar.						CO2	
UNIT-III	Cities And Urbanism Through Texts And Theories						Periods: 10		
		- Introduction to and discussion of key texts and theories of cities and urbanism - Imageability and Lynch, Townscape and Cullen - Social aspects of urbanism and the works of Jane Jacobs and William Whyte.						CO3	
UNIT-IV	Contemporary Urbanism And Urban Interventions						Periods: 09		
		- Understanding aspects, issues and solutions related to urbanism today through study of literature and best practices/case studies in urban design - Topics to include urban decay, change and renewal, place making, heritage, conservation, identity, suburban sprawl, gated communities, generic form, privatization of public realm, real estate's role, transportation, zoning, globalization, technology, digital age, sustainability, community participation, gender, class, power.						CO4	
UNIT-V	Urban studies						Periods: 09		
		Introduction to study and interpretation of cities (especially Indian) through understanding published studies/ analysis - The focus will be on components/aspects as well as tools/ methods. Tools and methods to include different types of maps/mapping, drawings, sketches, photo documentations, reading, data collection and analysis.						CO5	
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods: 0		Total Periods: 48			
Reference Books									
<ol style="list-style-type: none"> 1. A.E.J. Morris, "History of Urban Form before the Industrial Revolution", Prentice Hall, 1996. 2. Edmund Bacon, "Design of Cities", Penguin, 1976. 3. Gordon Cullen, "The Concise Townscape", The Architectural Press, 1978. 4. Michelle Provoost et al., "Dutchtown", NAI Publishers, Rotterdam, 1999. 5. 'Time Saver Standards for Urban Design', Donald Natson, McGraw Hill, 2003. 6. Kevin Lynch, "The Image of the City", MIT Press, 1960. 7. Rithchie. A, "Sustainable Urban Design: An Environmental Approach", Taylor & Francis, 2000. 									

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	1	2	1	2	-	2	-	3	2	3	2	-
CO2	-	-	1	1	2	3	-	2	-	2	2	2	3	-
CO3	-	1	2	1	-	2	-	-	-	1	-	1	2	-
CO4	-	1	1	1	1	3	-	-	-	2	-	2	3	-
CO5	-	-	1	1	1	2	-	2	-	2	2	2	2	-
Average	-	0.4	1.2	1.2	1.0	2.4	-	1.2	-	2.0	1.2	2.0	2.4	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture				Programme : B.Tech (Architectural Assistantship)				
Semester: Sixth				Course Category Code: PCC			Semester Exam :- TY	
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA122	Project Management	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Summarize the characteristics and various approaches for Project management						
	CO2	Summarize the Project programming, balancing of resources and phasing of activities						
	CO3	Analyse CPM network, network logic of Inter relationships, various network techniques						
	CO4	Interpret theory of probability and statistics, time estimation for PERT network						
	CO5	Analyze two-dimensional network, cost time relationship, crashed estimates for the activities and compression potential.						
UNIT-I	Introduction to Project Management					Periods: 9		
Introduction to project Management concepts of background of management, purpose, goal and objectives, characteristics of projects and different aspects of management. Traditional management system, Gantt's approach load chart, progress chart, bar-chart merits and limitation. Schedule, time estimates units.							CO1	
UNIT-II	Projects Programming					Periods: 10		
Project programming, resources balancing, phasing of activities, program, scheduling, project control, reviewing, updating and monitoring. Introduction to modern management, concepts, uni dimensional management techniques – Introduction to PERT and CPM introduction to network concepts, network elements and inter-relationships.							CO2	
UNIT-III	Network – Techniques					Periods: 10		
Network techniques, network logic of inter relationships, activity information, data sheets, development of network. CPM for management, CPM network analysis, identification of critical path float computation result sheets.							CO3	
UNIT-IV	PERT Network					Periods: 9		
PERT Network, introduction to the theory of probability and statistics, probabilistic time estimation for activities of PERT network.							CO4	
UNIT-V	Project Cost					Periods: 10		
Introduction to two dimensional network analysis, activity cost information. Cost time relationship, crashed estimates for the activities, compression potential, cost slope, utility, data sheet, project direct cost and indirect cost. Crashed program, network compression least cost solution least time solution, optimum time solution. Network techniques, PERT/CPM, generating alternative strategies using computers.							CO5	
Lecture Periods: 48		Tutorial Periods: - 0			Practical Periods: 0-		Total Periods: 48	

Reference Books

1. Dr. B.C. Punmiya and K.K. Khandelwal – “Project Planning and Control with Pert/CPM” Laxmi Publications. New Delhi, 1987.
2. S.P. Mukhopadhyay, “Project Management for Architects and Civil Engineers”, IIT, Kharagpur, 1974.
3. Jerome D. Wiest and Fenfinand K. Levy, “A Management Guide to PERT / CPM”. Prentice Hall of Indian Pub. Ltd. New Delhi 1982.
4. R.A. Burges and G. White, “Building production and Project Management”, The Construction Press, London 1979.

AAA122

Project Management

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-		1	-	-	1	-	-	-	-	1	1	2	-
CO2	1		1	-	1	2	-	1	-	-	2	1	2	-
CO3	1		1	-	3	-	-	1	-	-	3	2	3	-
CO4	2		2	-	2	-	-	-	-	-	2	1	3	-
CO5	-		-	-	2	2	-	1	-	-	2	1	3	-
Average	0.8		1.0	-	1.6	1.8	1.6	1.2	-	-	2.0	1.2	2.6	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department : Architecture		Programme : B.Tech(Architectural Assistantship)						
Semester : Sixth		Course Category Code : PCC			Semester Exam Type: TY			
Course Code	Course Name	Periods/Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA123	Design of Structures -II	3	1	0	4	25	75	100
Prerequisite:	---							
Course Outcome	The Course will enable the student to							
CO 1	Design the One way Slab using Limit State method							
CO 2	Design the Two way Slab using Limit State method							
CO 3	Design the Staircase using Limit State method							
CO 4	Design the Column using Limit State method							
CO 5	Design the Column Footing using Limit State method							
UNIT - I	Limit State Design of One way Slab					Periods : 12		
Classification of Slabs – Effective spans – Loads (DL and IL) on floor/roof slabs and stairs (IS: 875-1987) – Strength and Stiffness requirements –Minimum and maximum permitted size, spacing and area of main and secondary reinforcements as per IS 456 - 2000- Cover requirement to reinforcements in slabs- Design of cantilever/simply supported one way slabs and sunshades by limit state method – Check for shear and stiffness – Curtailment of tension reinforcement –Anchoring of reinforcement.							CO1	
UNIT - II	Limit State Design of Two way Slab					Periods : 13		
Introduction –Effective spans –Thickness of slab for strength and stiffness requirements - Middle and Edge strips – B.M coefficients as per IS:456 – Design B.Ms for Simply supported, Restrained and Continuous slabs – Tension and Torsion reinforcement requirement– Design of two way slabs using B.M. coefficients – Curtailment of reinforcement – Check for stiffness only.							CO2	
UNIT - III	Limit State Design of Staircase					Periods : 13		
Types of stairs according to structural behaviour- Requirements of Stairs- Planning a staircase – Effective span of stairs – Effective breadth of flight slab- Distribution of loads on flights – Design of cantilever steps – Design of doglegged stairs spanning parallel to the flight - Planning of open well staircase.							CO3	
UNIT - IV	Limit State Design of Column					Periods : 13		
Limit state of collapse in compression – Assumptions - Limiting strength of short axially loaded compression members - Effective length of compression members – Slenderness limits for columns – Classification of columns -Minimum eccentricity for column loads – Longitudinal and Transverse reinforcement requirements as per I S 456-2000 – Cover requirement - Design of axially loaded short columns with lateral ties.							CO4	
UNIT - V	Limit State Design of Column Footing					Periods : 13		
Basic requirements of Footings-Types of R.C footings –Minimum depth below GL- Footings with uniform thickness and varying thickness (sloped footing) – Critical sections for BM, Transverse/Punching Shears – Minimum reinforcement, Distribution of reinforcement, Development length, Anchorage, Cover, Minimum edge thickness requirements as per IS 456- 2000 – Design of Isolated footing (square and rectangular) with uniform by limit state method.							CO5	
Lecture Periods : 48		Tutorial Periods : 16		Practical Periods : --		Total Periods:64		
Reference Books:								
1. Ramamrutham, S. “Design of Reinforced Concrete Structures”, Dhanpat Rai & Sons, New Delhi, 1996. 2. Sinha, N.C. & Roy, S.K., “Reinforced Concrete Structures”, S. Chand & Company Ltd., New Delhi, 1983. 3. Ashok. K. Jain, “Reinforced concrete structures”, New Chand & Bros Roorkee, 1992. 4. .H.J. Shah, “Reinforced concrete - Vol I”, Charotor Publishing House, Annand, 1994 5.Dr. B.C. Punmia, ‘Reinforced Concrete Structures’ Vol, 1 and 2’, Laxmi Publication, Delhi, 2015. 6.S.Unnikrishnan Pillai and Devados Menon, ‘Reinforced Concrete Design’, Tata McGraw Hill Publishing Co. Ltd., New Delhi, 2017. 7.S.N. Sinha, “Reinforced Concrete Design”, Tata McGraw Hill , 2017								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	2	-	2	-	-	-	-	-	1	3	-
CO2	3	2	1	2	-	2	-	-	-	-	-	1	3	-
CO3	3	2	1	2	-	2	-	-	-	-	-	1	3	-
CO4	3	2	1	2	-	2	-	-	-	-	-	1	3	-
CO5	3	2	1	2	-	2	-	-	-	-	-	1	3	-
Average	3.0	2.0	1.0	2.0	-	2.0	-	-	-	-	-	1.0	3.0	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Sixth		Course Category Code: PEC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA204	Landscape Architecture	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
CO1	Interpret the role of landscape design with respect to macro scale of sustainability and Ecology as well as in the micro scale of shaping of outdoor environments							
CO2	Interpret the elements of landscape design and their scope.							
CO3	Develop Sensitivity towards evolution of different garden and landscape design across time and context							
CO4	Perceive landscape design with respect to site planning and different functional typologies of spaces							
CO5	Make use of the planning and design in urban areas.							
UNIT-I	Introduction				Periods: 08			
Introduction to landscape Architecture, ecology, ecological balance, landscape conservation, reclamation and landscaping of derelict lands, environmental impact assessment							CO1	
UNIT-II	Elements of Landscape Architecture and Landscape Design				Periods: 09			
Elements of landscape – land elements, land form plants and planting, water, lighting etc.; Factors to be considered, Use and application of plant materials in landscape design, and other components involved							CO2	
UNIT-III	History of Landscape Architecture				Periods: 10			
Development of landscape design: selected examples from Eastern, Central and Western traditions; Ancient Heritage - Egypt, Greece, Rome; Western Civilization – Europe: Italy and England; Mughal Landscapes and study of contemporary landscape Architecture							CO3	
UNIT-IV	Urban Landscape				Periods: 10			
Basic principles and elements of Urban landscape, Significance of landscape in urban areas, introduction to street furniture, road landscaping, waterfront development, landscaping of residential areas, Industrial Landscaping							CO4	
UNIT-V	Landscape Exercise				Periods: 11			
Landscape design of a neighborhood open space (area of 2000 to 3000 sq. meters)							CO5	
Lecture Periods:48		Tutorial Periods:0		Practical Periods:0		Total Periods:48		
Reference Books								
1. T S S for Landscape Architecture, Mc Graw Hill, Inc, 1995. 2. Grant W Reid, From Concept to Form in Landscape Design, Van Nostrand Reinhold Company, 1993. 3. Brian Hacket, Planting Design. 4. T.K. Bose and Chowdhury, Tropical Garden Plants in Colour, Horticulture And Allied Publishers, Calcutta, 1991. 5. Motloch, J.L.,Introduction to Landscape Design”, Van Nostrand Reinhold Publishing Co., New York, 1991. 6. Bring, M, “Japanese Gardens: “design & Meaning 7. Simonds, J.O., “Earthhscape: A Manual of Environmental planning”, McGraw Hill Book Co., New York, 1978.								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	-	-	-	2	3	-	-	-	-	-	-	-
CO2	-	-	-	-	-	2	-	-	-	-	-	1	2	1
CO3	-	-	-	-	-	-	3	-	-	-	-	3	-	-
CO4	2	3	-	3	-	2	3	-	-	-	3	3	1	-
CO5	2	3	-	3	-	2	3	-	-	-	3	3	3	3
Average	1.2	1.2	-	1.2	-	1.6	2.4	-	-	-	1.2	2.0	1.2	0.8

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Sixth		Course Category Code: PEC				Semester Exam Type:- TY		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA205	Housing	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Develop awareness regarding the different government agencies and their approach to the improvement of the housing conditions in India						
	CO2	Relate to the current socio-economic conditions in India						
	CO3	Develop awareness regarding the housing standards and norms						
	CO4	Develop familiarity with Design guidelines and Environmental impact of Building materials.						
	CO5	Develop awareness regarding Government housing agencies such as HUDCO.						
UNIT-I	Introduction To Housing And Housing Issues					Periods: 10		
Housing demand and need, Role of Government and public agencies in Housing development, National housing policy, comparison of housing policies and programmes of developed and developing country, Housing agencies, housing programmes and resources, Housing finance.						CO1		
UNIT-II	Socio Economic Aspects					Periods: 9		
Social factors influencing Housing Design – identity, safety, convenience, access, amenities etc, economic factors -affordability and its relationship to house income, incremental housing concept, Slum Upgrading and sites and services schemes and reconstruction process.						CO2		
UNIT-III	Housing standards.					Periods: 9		
Different types of housing standards – spatial standards, safety standards, standards for amenities, Methodology of formulating standards, UDPFI – guide lines, standard and regulations – DCR –performance standards for housing.						CO3		
UNIT-IV	Modern Techniques In Housing Construction					Periods: 10		
Prefabrication techniques –modular house, panelized and precast homes, sustainable practices – zero energy home, eco housing, green homes - TERI – Griha and its rating system, Recent advancement in materials, Design guidelines, Environmental impact of Building materials, Environmental quality						CO4		
UNIT-V	Housing Design And Process.					Periods: 10		
Traditional housing, row housing, cluster housing – apartments and high-rise housing, gated community, Government housing – HUDCO financed project for economically weaker section - their advantages and disadvantages. Methods and approaches to housing design. Various stages and tasks in project development – feasibility study, detailed study						CO5		
Lecture Periods:48		Tutorial Periods: 0		Practical Periods: 0		Total Periods:48		
Reference Books								
1. Kavita Datta and GA.Jones, “Housing and Finance in Developing Countries”, Routledge, London, 1999.								
2. Eugene Henry Klaber, “Housing Design”, Reinhold publishing corp.								
3. Daniel Vallero and Chris Brasier, “Sustainable Design – The science of sustainability and Green Engineering”, Wiley, 2008								
4. Thomas E Glavinich, “Green Building Construction”, Wiley, 2008								
5. Geoffrey K. Payne, “Low Income Housing in the Development World”, John Wiley and Sons, Chichester, 1984.								
6. Martin Evans, “Housing, Climate and Comfort, Architectural Press” , London, 1980								
7. Graham Towers, “An introduction to Urban Housing Design”, Graham Towers, 2005								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	1	2	-	-	2	1	2	1	-	1	2	1	-
CO2	-	1	1	-	3	2	1	2	1	-	2	3	1	-
CO3	-	1	1	-	1	2	1	-	1	-	2	2	2	-
CO4	-	1	1	-	1	3	1	2	1	-	2	3	3	-
CO5	-	1	2	-	1	-	2	2	1	-	1	3	3	-
Average	-	1.0	1.4	-	1.2	1.8	1.2	1.6	1.0	-	1.6	2.6	2.0	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Sixth		Course Category Code: PEC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA206	Town Planning	3	0	0	3	25	75	100
Prerequisite		--						
Course Outcome	The Course will enable the student to							
	CO1	Infer the principles of town planning and its significance.						
	CO2	Infer the importance of surveys and the process of zoning.						
	CO3	Discover the role of town planning in providing proper housing and civic facilities.						
	CO4	Examine the various recreational requirements of a town and the process of preparing master plan.						
CO5	Discover the role of town planning in providing proper roads and traffic management.							
UNIT-I	Introduction						Periods: 10	
Objects of town planning, principles of town planning, Origin and growth of towns – development of towns, Modern town planning in India, Socio – Economic aspects of town planning. Selection of site for an ideal town.							CO1	
UNIT-II	Surveys & Zoning						Periods: 10	
Various types of surveys to be conducted for town planning project. Data to be collected in different types of town planning surveys. Types of planning - a brief note on urban, rural and regional planning. Zoning: Definition – objects and principles of zoning. Advantages of zoning, Special Economic Zone (SEZ), Maps for zoning.							CO2	
UNIT-III	Housing & Public Buildings						Periods: 09	
Classification of residential building as per HUDCO norms, Housing in villages, Low Cost Housing, Housing policy, different types of housing agencies involved in housing, investment in Housing, Housing Problems in India. Slums: Causes, growth, characteristics, effects, slum clearance and re-housing, prevention of slum formation, financial assistance for slum clearance. Public buildings: Classification – location, Design Principles of public building, Grouping of public buildings.							CO3	
UNIT-IV	Recreation Measures & Master Plan						Periods: 09	
Parks- park ways, Playgrounds, Theme parks, boulevards and their space standards, knowledge of Landscape sketches for a) Residential Building, b) Public Buildings and c) Industrial Buildings. Master Plan: Meaning – Definition – objects and necessity of master plan, Data and Drawings required for master planning - Building bye laws - Satellite Towns – Smart cities- definition and features							CO4	
UNIT-V	Urban Roads & Traffic Management						Periods: 10	
Urban Roads: objects, requirements, classification, types of street systems, through and bypass roads, outer and inner ring roads, expressways, freeways. Traffic Management: objects, traffic surveys, traffic congestion, traffic control, road junctions and intersections, parking, road accidents, traffic capacity of roads, traffic islands, roundabouts, traffic signals, road signs, road markings, street lighting in a town.							CO5	
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods: 0		Total Periods: 48		
Reference Books								
<ol style="list-style-type: none"> 1. Rangwala, “Town Planning”, 32nd Edition, Charotar Publication, India, 2023. 2. G.K Hiraskar , “Fundamentals of Town Planning”, Dhanpat Rai Publications, India, 2019 3. Abir Bandyopadhyay, “Town Planning”, Books & Allied Ltd, India, 2011 								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	1	2	1	2	3	-	2	-	2	2	2	2	-
CO2	-	1	1	1	2	3	-	2	-	1	2	1	1	-
CO3	-	1	1	2	1	3	-	-	-	1	2	2	2	-
CO4	-	1	2	1	2	3	-	2	-	2	1	3	3	-
CO5	-	1	2	2	1	2	-	2	-	3	-	3	3	-
Average	-	1.0	1.6	1.4	1.6	2.8	-	1.6	-	1.8	1.4	2.0	2.0	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture			Programme : B.Tech (Architectural Assistantship)					
Semester: SIXTH			Course Category Code: PCC			Semester Exam Type:- LB		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA124	GIS Application In Town Planning	0	0	3	1.5	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Discover the basic concepts of GIS.						
	CO2	Infer GIS application in Town Planning.						
	CO3	Discover the advance analytical techniques in GIS						
	CO4	Examine the basic concepts of Remote Sensing.						
CO5	Utilize GIS softwares.							
UNIT-I	Introduction						Periods: 09	
GIS, GIS Data sources, GIS Analysis, Terrain analysis concepts from perception of urban planners.							CO1	
UNIT-II	GIS Planner Application						Periods: 09	
Hands-on practical exercise exposure of Town Planning - projections and coordinate systems transformation, geo-referencing, digitization - topology, map layout of human settlements /planning - compilation of data from various urban data sources like Total Station, GPS, and LiDAR							CO2	
UNIT-III	Advance Analytical Techniques						Periods: 10	
Geo-coding, table join and relates - geostatistical analysis, overlay analysis, surface interpolation methods - data exploration techniques of urban environment parameters, thematic map preparation.							CO3	
UNIT-IV	Remote Sensing						Periods: 10	
LULC (Land Use Land Cover) image classification techniques - information on free sources of remote sense satellite data and DEM, construction of DEM using LiDAR data like .las files – creating and visualizing 3D GIS data, topographic maps and existing planning maps of ELU (Existing Land Use), PLU (Proposed Land Use), revenue, cadastral and land parcel maps							CO4	
UNIT-V	GIS Software						Periods: 10	
Concepts presented in Units-I to IV will be put into practice through hands-on laboratory exercises utilizing the GIS software.							CO5	
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods: 0		Total Periods: 48		
Reference Books								
1. Martin van Maarseveen, Javier Martinez, Johannes Flacke, "GIS in Sustainable Urban Planning and Management: A Global Perspective", CRC Press, Boca Raton, 2019.								
2. Manish Kumar, R. B. Singh, Anju Singh, Ram Pravesh, Syed Irtiza Majid, Akash Tiwari, "Geographic Information Systems in Urban Planning and Management", Springer Singapore, 2023.								
3. Henk J. Scholten, John C. H. Stillwell, "Geographical Information Systems for Urban and Regional Planning", Springer Dordrecht, Berlin, 1990.								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	1	-	1	3	3	-	-	-	2	-	1	2	-
CO2	2	1	-	2	3	3	-	-	-	2	-	2	2	1
CO3	1	-	-	2	1	2	-	-	-	2	-	2	2	2
CO4	2	1	1	1	3	3	-	-	-	3	-	3	3	2
CO5	2	1	1	2	1	3	-	-	-	3	-	3	3	1
Average	1.4	0.8	0.4	1.6	2.2	2.8	-	-	-	2.4	-	2.2	2.4	1.2

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Sixth		Course Category Code: PCC			Semester Exam Type: LB-			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA125	Architectural Design-III	0	0	6	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
CO1	Interpret knowledge on space standards for a shopping complex building							
CO2	Design a shopping complex or shopping centre on a proposed site conditions and space requirement by incorporating the bye laws							
CO3	Perceive space standards and bye laws for an Apartment building							
CO4	Design an Apartment building on a proposed site conditions and space requirement by incorporating the by laws							
CO5	Solve the design problems within a short period of time.							
UNIT-I	Shopping Complex – Data Collection and Case Study				Periods: 9			
Shopping Centre- Space standards –Sit analysis- Climatic data and analysis multi planning circulation analysis – massing problems involving building technology –							CO1	
UNIT-II	Shopping Complex – Design phase				Periods: 10			
Design and detailing for movement of physically handicapped and elderly persons within and around buildings – green building technologies and landscaping.							CO2	
UNIT-III	Apartment buildings - Data Collection and Case Study				Periods: 9			
Residential buildings -Apartments - Space standards –Sit analysis- Climatic data and analysis multi planning circulation analysis – massing problems involving building technology –							CO3	
UNIT-IV	Apartment buildings - Design phase				Periods:10			
Design and detailing for movement of physically handicapped and elderly persons within and around buildings – green building technologies and landscaping.							CO4	
UNIT-V	Nursing Home--Time problem.				Periods: 10			
Time problem on Design of Nursing Home – preparation of drawings with the Design standards.							CO5	
Lecture Periods:0		Tutorial Periods:0		Practical Periods:48		Total Periods:48		
Reference Books								
1. De Chiara and Callender, “Time Saver Standards Building Types”, McGraw Hill Co., 2 nd Editions, 1980.								
2. Edward D. Mills, Planning-“the Architects Handbook” – 10th Edition, British Library C Taloguing in Publishing Data, 1985.								
3. Wakita / Linde, “The Professional practice of Architectural working, drawing” Jonh Wiley & Sons, 1984.								
4. Andrew Alpern, “Handbook of specialty Elements in Architecture”, McGraw Hill Book Co., 1982.								
5. Neufert Architect’s Data”, Rudolf Hefg, Crosby Lockwood and Sons Ltd., 1970								

Graduate Attributes	Course Outcomes												PSO1	PSO2
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
Engineering knowledge	-	-	2	-	-	2	2	-	-	-	-	2	3	-
Problem analysis	-	2	2	-	2	1	3	-	-	-	2	1	3	2
Design/Development of Solutions	-	1	2	-	-	2	2	-	-	-	-	3	3	-
Conduct investigations of complex problems	2	2	1	-	1	2	3	-	-	-	2	3	3	2
Modern tool usage	2	-	2	-	1	2	2	-	-	-	2	3	3	3
The engineer and society	0.8	1.0	1.8	-	0.8	1.8	2.4	-	-	-	1.2	2.4	3.0	1.4
Environment and sustainability														
Ethics														
Individual and team work														
Communication														
Project management and finance														
Life-long learning														
Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.														
Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology														

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Sixth		Course Category Code: ESC				Semester Exam Type: -LB		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA126	Computer Applications in Architecture III	0	0	3	1.5	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Import the CAD objects into a rendering software to obtain the desired rendered views.						
	CO2	Create the rendered view of a building with the desired lighting levels in rendering software.						
	CO3	Create the rendered view in the software with the desired materials for various building components.						
	CO4	Create the rendered view of a residential building in a realistic manner with desired environment by using the rendering software.						
CO5	Create walk throughs for a proposed building project in the software.							
UNIT-I	User Interface of the Rendering Software						Periods: 9	
<p>Typical User interface of the rendering software—Import/ Export options—Creation of 3d objects and surfaces using the creative and modify tools--Import the 3d objects created in any CAD software to the rendering software using Import options with properties set to layers and colours.</p> <p><u>Exercises:</u></p> <ol style="list-style-type: none"> 1. Creation of Basic forms like Box, Cylinder, Cone and Sphere using the Creative tools. 2. Import a residential building created using CAD 3D tools to the rendering software. 							CO1	
UNIT-II	Camera tools to obtain a desired view						Periods: 10	
<p>Use various types of camera like Target and Free to obtain the desired Worms eye view, Normal eye view and Bird's eye view. Study and practice the features of various camera and its applications in rendering. – Various parameters of the cameras--- Lens parameter—Cone and Horizon---Environment ranges and target distances.</p> <p><u>Exercises:</u></p> <ol style="list-style-type: none"> 3. Create a desired view of an imported CAD objects with free camera.. 4. Create a desired view of an imported CAD objects with Target camera by using the parameters. 							CO2	
UNIT-III	Application of material mapping on the surface and objects						Periods: 10	
<p>Various Material parameters—Presets, colour, surface, reflections, transparency and Surface catering –Material Browser and Material mapping.</p> <p><u>Exercises:</u></p> <ol style="list-style-type: none"> 5. Create a Chair using creative tools and apply materials to it. 6. Create a Dining table with wooden support and glass top. Apply materials options using wood and glass to it. 7. Import a residential building from CAD software and apply material using material mapping options. 							CO3	

UNIT-IV	Rendering tools to obtain the view of a building in a realistic manner	Periods: 9
Rendering and scene setting to create a photo realistic picture—Import vehicles and Landscape elements --impact of material mapping, lighting, environment setting and image filling in rendering – various options to obtain the output in different mode of files—Common parameters of rendering. <u>Exercises:</u> 8. Import a single bedroom house from CAD software and obtain the exterior view using rendering tool in JPEG format using the lighting, material mapping and environment setting for a single frame using a camera. 9. Import a single bedroom house from CAD software and obtain the interior view in JPEG format using the rendering tool.		CO4
UNIT-V	Creating a walkthrough using Animation tools	Periods: 10
Constraints and Controllers in creating animation—Walk through Assistant ---Role fo Modifiers in animation--Various options to obtain the output in video formats. <u>Exercises:</u> 10. Import a single bedroom house from CAD software and create the animation out put in “.avi” file mode using a camera with path constrain.		CO5
Lecture Periods: 0	Tutorial Periods: -	Practical Periods: - 48
Total Periods: 48		
Reference Books		
1. Mastering AutoCAD 2021 and AutoCAD LT 2021, Brian C. Benton, George Omura 2. Fiorello. J. A., ‘CAD for Interiors beyond the basics’, Wiley publications, 2011. 3. AutoCAD for Beginners by Cadfolks. 4. Autodesk 3Ds Max Basics Guide by Kelly L Murdock 5. Rendering in Sketchup by Daniel Tal		

AAA16 Computer Applications in Architecture III

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	3	2	2	3	-	-	-	2	3	-	1	1	3
CO2	-	2	2	2	3	-	-	-	2	3	-	1	1	3
CO3	1	3	2	2	3	-	-	-	2	3	-	1	1	3
CO4	1	3	2	2	3	-	-	-	2	3	-	1	1	3
CO5	1	3	2	2	3	-	-	-	2	3	-	1	1	3
Average	0.8	2.8	2.0	2.0	3.0	-	-	-	2.0	3.0	-	1.0	1.0	3.0

Mapping Correlation	Low	Medium	High
	1	2	3

Department : HSS			Programme : B.Tech (Architectural Assistantship)						
Semester : Sixth			Subject Category: MCC			Semester Exam Type: TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks			
		L	T	P	C	CA	SE	TM	
SHA103	Essence of Indian Traditional Knowledge	3	0	0	0	-	-	-	
Prerequisite	--								
Course Outcome	The Course will enable the student to								
	CO1	understand connect up and explain basics of Indian traditional knowledge in modern scientific perspective							
UNIT-I						Periods: 24	CO1		
Basic structure of Indian knowledge system, Modern science and Indian knowledge system, Yoga and holistic health care.									
UNIT-II						Periods: 24			
Philosophical tradition, Indian linguistic tradition, Indian Artistic tradition.									
Lecture Periods: 48		Tutorial Periods:		Practical Periods:		Total Periods: 48			
Reference Books									
1. N. Sivaramakrishnan (Ed.) Culteral Heritage of India – Course Materal, Bharatiya Vidya Bhavan, Mumbai 5 th edition, 2014.									
2. Swami Jitatmanand, Modern Physics and Vedanta, Bharatiya Vidya Bhavan.									
3. Fritzof Capra, Tao of Physics.									
4. Yoga Sutra of Patanjali, Ramakrishna Mission, Kolkatta.									
5. R.N. Jha, Science of Conciouness Psychotherapy and yoga Practices, Vidyanidhi Prakashan, Delhi 2016.									
6. S.C Chaterjee and D.M Datta, An Introduction to Indian Philosophy, University of Calcutta, 1984.									
7. Krishna Chaitanya, Arts of India, Abhinav Publications, 1987									

SAH103 Essence of Indian Traditional Knowledge

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	1	-	2	-	2	-	-
Average	-	-	-	-	-	-	-	1	-	2	-	2	-	-

Mapping Correlation	Low	Medium	High
	1	2	3

VII SEMESTER

Department : Architecture		Programme : B.Tech(Architectural Assistantship)						
Semester : Seventh		Course Category Code : PCC				Semester Exam Type: TY		
Course Code	Course Name	Periods/Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA127	Estimation and Specifications	3	0	0	3	25	75	100
Prerequisite:		--						
		The Course will enable the student to						
Course Outcome	CO 1	Explain the different types of estimates						
	CO 2	Determine the Estimate of residential building						
	CO 3	Determine the Estimate of structures other than building						
	CO 4	Evaluate the rates for various types of work						
	CO 5	Evaluate the valuation and rent for buildings						
UNIT - I		Introduction				Periods :9		
Estimates – types of estimates – Advantages – Method of measurements – Unit of measurement for various item of work – Method of measurement as per IS 1200, method of estimation; Centre line method of estimation – Examples using above methods.							CO1	
UNIT - II		Estimation of buildings				Periods :10		
Load bearing and framed structures – Calculation of quantities of brick work, RCC, PCC, Plastering, white washing, Color washing and painting for shops, single room & double room building and simple residential buildings with flat roof.							CO2	
UNIT - III		Estimation of other structures				Periods :10		
Estimation of septic tank, soak pit – Water supply pipe line – Sewer line – Various types of Arches – Calculation of brick work and RCC works in Arches - Estimation of retaining walls.							CO3	
UNIT - IV		Specification and rate analysis				Periods :10		
Specification: purpose and basic principles of general and detailed specification of various item of work – Earth work excavation – Cement concrete – Damp proof course – Form work – Brick and stone masonry – Flooring- Painting of wood work. Analysis of rate – Purpose – Quantity of materials per unit rate of work – Requirement of labour and materials for different works – Obtaining the rate for different works using local schedule of rates – Cement mortar – Cement concrete – RCC- Brick masonry – Plastering – Flooring – Painting.							CO4	
UNIT - V		Valuation				Periods :9		
Valuation – Purpose, definition of common terms used in valuation such as free and lease hold property – Gross income, net income, outgoings, sinking fund, scrap value, salvage value, market value, book value, capital cost and depreciation methods – Valuation of building using different methods with examples – Fixation of rent for a building - Valuation of land.							CO5	
Lecture Periods : 48		Tutorial Periods :0		Practical Periods : -0-		Total Periods:48		
Reference Books:								
1. Dutta. B.N., Estimating and Costing in Civil Engineering Practice, S.Dutta& Co. Lucknow, 1999. 2. Rangwala.S.C. Valuation of Real Estate Properties, Charoter Publishing House, Anand, 1997. 3. Puducherry Schedule of Rates (PSR), Pondicherry Region, PWD, Government of Puducherry, 4. M.Chakraborti, 'Estimating, Costing, Specification and Valuation in Civil Engineering, Chakraborti, 2010. 5. Gurcharan Singh and Jagdish Singh, 'Estimating Costing and Valuation', Standard Publishers Distributors, 2012.								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1
CO1	2	1	1	1	-	2	-	-	-	-	-	-	2	-
CO2	2	1	1	1	1	2	-	-	-	-	-	2	2	-
CO3	2	1	1	1	1	2	-	-	-	-	-	2	2	-
CO4	2	1	1	1	1	2	-	-	-	-	-	2	2	-
CO5	2	1	1	1	1	-	-	-	-	-	-	-	2	-
Average	2.0	1.0	1.0	1.0	0.8	1.6	-	-	-	-	-	1.2	2.0	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department : Architecture			Programme : B.Tech (Architectural Assistantship)						
Semester : Seventh			Course Category Code : PCC				Semester Exam Type: TY		
Course Code	Course Name	Periods/Week			Credit	Maximum Marks			
		L	T	P		C	CA	SE	TM
AAA128	Environmental Engineering	3	0	0	2	25	75	100	
Prerequisite:		--							
		The Course will enable the student to							
Course Outcome	CO 1	Illustrate the sources and quality of water							
	CO 2	Explain the water treatment methods and Distribution of water							
	CO 3	Illustrate the sewage system and sewage treatment units							
	CO 4	Illustrate Environment Pollution and Solid waste management							
	CO 5	Summarize Ecosystem and its Structures							
UNIT - I		Sources and Quality of Water					Periods :10		
Water supply Scheme - objectives - Domestic, industrial, commercial and public requirements - Various methods of estimating population - Variations in rate of demand. Surface and groundwater sources - Forms of underground sources like wells, Infiltration wells and galleries, Intake structures, tube wells - Sanitary protection of wells. Impurities in Water - Testing of Water - Collection of Water Sample - Physical, Chemical, Bacteriological Tests - Standards of Drinking Water - Water Borne Diseases and their Causes.							CO1		
UNIT - II		Treatment and Distribution of Water					Periods :10		
Object of Water Treatment – Function of Units – Sedimentation – Purpose – Types of Sedimentation Tank – Coagulation – Coagulants – Flocculation – Coagulation Process. Classification of Filters – Types of Filters .Necessity of Disinfection – Methods of Disinfection – Chlorination – Methods of Chlorine – Forms of Chlorination –Water Softening -Distribution System - Methods of Distribution - Systems of Water Supply -Layouts of Distribution.							CO2		
UNIT - III		Waste Water Engineering					Periods :10		
Sanitation- Purpose- Terms - Systems of Sanitation - Quantity of Sewage - Variation in Rate of Flow of Sewage -Estimation of storm water - problems - Minimum Size of Sewer – Shapes of Sewer - Materials used for Sewer - Laying and Testing of Sewer Lines – Ventilation of Sewers - Cleaning of Sewers – Flow Diagram of Primary Treatment – Flow Diagram of Secondary Treatment – Filters – Types - Trickling Filters - Construction and working of septic tanks – Soak Pits – Dispersion Trenches							CO3		
UNIT - IV		Environmental Pollution and solid waste management					Periods :9		
Water pollution – sources, effect, control of water pollution - Soil pollution - sources, effect, control of soil pollution - Noise pollution - sources, effect, control of noise pollution - Air pollution - sources - effects of air pollution on human beings, plants, animals, materials - control equipment - Ozone layer depletion . Solid Waste Disposal – Necessity – Method of Solid Waste Disposal - dumping, sanitary landfill, composting - Energy from waste.							CO4		
UNIT - V		Ecosystem					Periods :9		
Concept of an ecosystem-Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Food chains, food webs and ecological pyramids. Introduction, types, Characteristic features, structure and function of forest, grass land, desert and aquatic (fresh water, marine) ecosystem.							CO5		
Lecture Periods : 48		Tutorial Periods : 0			Practical Periods : -0-		Total Periods:48		

Reference Books:

1. Duggal, K.N., Elements of Environmental Engineering, S. Chand & Company, New Delhi 1996.
2. Punmia.B.C., Ashok K Jain and Arun K Jain., Water Supply Engineering: Environmental Engineering 1, Laksmi Publications (P) Ltd., 2016
3. Anubha Kaushik and C.P. Kaushik, Environmental Science and Engineering, New Age International (P) Ltd, New Delhi, 2009. (Unit I)
4. S.S. Dara, A Text Book of Environmental Chemistry and Pollution Control, S. Chand and Company Ltd, New Delhi, 2008. (Unit II, III, & V)
5. S.K. Garg, "Water Supply and Sanitary Engineering", PHI Kanna publishers, New Delhi".
6. S.C. Rangwala, Water Supply and Sanitary Engineering, Charotar Publishing House, New Delhi, 2007
7. G.S. Birdie and J.S. Birdie, Water Supply and Sanitary Engineering, Dhanpat Rai Publishers, New Delhi, 2010.
8. N.N. BASAK, Environmental Engineering, Tata McGraw hill publishing Company Ltd., New Delhi, 2010
9. A.KamalaD.I.kanthrao, Environmental Engineering, Tata McGraw hill publishing Company Ltd., New Delhi, 1985
10. Gurcharan Singh, Water supply and Sanitary Engineering vol.I& II, Standard publishers & distributors, New Delhi, 2007.

AAA128

Environmental Engineering

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	1	-	-	3	2	-	-	-	-	-	1	-
CO2	1	-	1	-	-	3	3	2	-	-	-	1	2	-
CO3	1	-	1	-	-	3	3	2	-	-	-	1	2	-
CO4	1	-	1	-	-	3	3	2	-	-	-	1	2	-
CO5	1	-	1	-	-	2	2	-	-	-	-	-	1	-
Average	1.2		1.0			2.8	2.0	1.2				0.6	1.6	

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Mechanical Engineering		Programme : B.Tech (Architectural Assistantship)						
Semester: Seventh		Course Category Code: PEC			Semester Exam Type: -TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA207	RENEWABLE ENERGY	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Design sustainable buildings based on solar energy concepts						
	CO2	Utilize the wind energy for power generation based on the site conditions.						
	CO3	Utilize the geothermal energy for comfort conditions and power generation in a building.						
	CO4	Interpret the concept of power generation from waves and tides of sea.						
	CO5	Utilize the Biomass for solid disposal system and power generations						
UNIT-I	Topic: Introduction On Solar Energy						Periods: 10	
Introduction to Solar energy- Solar radiation-radiation at the earth's surface–measurement of Solar radiation - Solar water heating system – Solar air heating system – Solar cooling–Solar power systems –electrical power generation (direct –indirect)–Solar thermal power plants –low, medium and high temperature power generation systems.							CO1	
UNIT-II	Topic: Wind Energy						Periods: 9	
Wind Data and Energy Estimation –Types of Wind Energy Systems –Performance - Site Selection –Details of Wind Turbine Generator – Safety and Environmental Aspects							CO2	
UNIT-III	Topic: Geo Thermal Energy						Periods: 10	
Geothermal Energy-origin- geothermal resources-classifications-hydro-thermal system-water dominated and vapour dominated fields, hot dry rock systems, utilization of geothermal resources – direct utilization – electricity generation – dry steam power plants – flash steam power plant – binary cycle power plants – geothermal fossil hybrid power plants – geothermal heat pump.							CO3	
UNIT-IV	Topic: Hydro And Tidal Entergy						Periods: 9	
Tidal energy – Wave Energy – Open and Closed OTEC Cycles – Small Hydroelectric power systems – Hydrogen and Storage - Fuel Cell Systems – Hybrid Systems.							CO4	
UNIT-V	Topic: Bio Mass And Bio Applications						Periods: 10	
Biomass – resources – conversion systems - gasifiers - Biogas plants –Digesters–Ethanol production –Bio diesel –Biomass Applications.							CO5	
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods:0		Total Periods: 48		

Reference Books

1. S.P.Sukhatme, Solar Energy –Principles of Thermal Collection and storage, Tata McGraw Hill Publishing Co., New Delhi, 1996.
2. N.K.Bansal et al, Renewable Energy Sources and Conversion Technology, Tata McGraw Hill Publishing Co., New Delhi, 1990.
3. Rai. G.D., “Non Conventional Energy Sources”, Khanna Publishers, New Delhi, 2011.
4. Twidell, J.W. & Weir, A., “Renewable Energy Sources”, EFN Spon Ltd., UK, 20
5. B.H.Khan “ Non – Conventional Energy Resources” McGraw Hill Publishing Co., Chennai – 2017
6. Godfrey Boyle, “Renewable Energy,Power for a Sustainable Future”, Oxford University Press,U.K., 1996.
7. Tiwari. G.N., Solar Energy – “Fundamentals Design, Modelling & Applications”, Narosa Publishing House, New Delhi, 2002

AAA207 Renewable Energy

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	3	3	3	3	3	-	-	-	2	3	1	3
CO2	2	3	3	3	3	3	3	-	-	-	2	3	1	3
CO3	2	3	3	3	3	3	3	-	-	-	2	3	1	3
CO4	2	3	3	3	3	3	3	-	-	-	2	3	1	3
CO5	2	2	3	3	2	3	3	-	-	-	2	3	1	3
Average	2.0	2.8	3.0	3.0	2.8	3.0	3.0	-	-	-	2.0	3.0	1.0	3.0

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Mechanical Engineering		Programme : B.Tech (Architectural Assistantship)						
Semester: Sixth		Course Category Code: PEC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA208	Solar Power Engineering	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Utilize the solar power for creating comfort conditions and infra structure facilities						
	CO2	Design and develop a prototype model of Solar power system for its utilization in buildings						
	CO3	Integrate solar heating to cater daily needs and comfort conditions in a building.						
	CO4	Evaluate the performance Characteristics of a Solar direct power system to enhance the efficiency.						
CO5	Design a building on sustainable concepts using solar photovoltaic cells.							
UNIT-I	Topic: Introduction To Solar Energy					Periods: 9		
Introduction to Solar energy – Solar energy utilization in India - Solar radiation – measurement of Solar radiation - Solar radiation data geometry – Solar radiation on horizontal and inclined surfaces – relationship among absorption and emittance and reflectance – Selective surfaces.						CO1		
UNIT-II	Topic: Solar Thermal Devices					Periods: 9		
Solar thermal devices: Flat plate collectors – materials for flat plate collector - collector efficiency– overall heat loss coefficient – performance of flat Plate collector. Concentrating collectors –improving efficiency of flat collector – cylindrical parabolic collector – compound parabolic collector – central receiver collector.						CO2		
UNIT-III	Topic: Solar Heating					Periods: 10		
Solar heating – air heating system – Solar energy heat pump system – Solar water heating system: forced and natural circulation system – passive Solar heating system – Solar cooling –absorption cooling – Solar dryers - Solar pond – Solar furnace						CO3		
UNIT-IV	Topic: Solar Power System					Periods: 10		
Solar power systems – electrical power generation – Solar thermal power plants – low, medium and high temperature power generation systems: using flat plate collectors or Solar ponds, concentrating collectors, central receiver and Solar chimneys – Solar energy process economics						CO4		
UNIT-V	Topic: Photovoltaic Cells					Periods: 10		
Photovoltaic Principle – materials for photovoltaic cells – efficiency of Solar cell – Solar cell materials - performance analysis of photovoltaic cells – Thermoelectric generator Solar cell – photochemical Solar cells – photovoltaic applications.						CO5		
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods: 0		Total Periods: 48		

Reference Books

1. S.P. Sukhatme, Solar Energy – Principles of Thermal Collection and storage, Tata McGraw Hill Publishing Co., New Delhi, 2008
2. J.A. Duffie & W. Beckmann, Solar Thermal Processes, John Wiley, 1980.
3. H.P.Garg and J. Prakash, Solar Energy, Tata McGraw – Hill Publishing Company Limited ,2007
4. G.D. Rai, Solar Energy Utilization, Khanna Publishers, 2005
5. Solar Cells – Operating Principles, Technology and System Applications /Martin A. Green/Prentice Hall Inc.
6. John Twidell and Tony Weir, Renewable Energy Resources, Routledge; 2 Edition (24 November 2005)
7. G.D. Rai Non-Conventional Energy Sources Published 2011 by Khanna Publishers
8. Dr. R.K. Singal, Non-conventional energy resources. S.K. Katara publication limited.
9. Jiu Sheng Hsieh, Solar Energy Engineering, Prentice Hall, 1991
10. M.A.Greem, Solar Cells, Prentice Hall Inc., Englewood Cliffs, 1982.

AAA208

Solar Power Engineering

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	3	3	3	3	3	-	-	-	2	3	1	3
CO2	2	2	3	3	3	3	3	-	-	-	2	3	1	3
CO3	2	2	3	3	3	3	3	-	-	-	2	3	1	3
CO4	2	2	3	3	3	3	3	-	-	-	2	3	1	3
CO5	2	2	3	3	3	3	3	-	-	-	2	3	1	3
Average	2.0	2.0	3.0	3.0	3.0	3.0	3.0	-	-	-	2.0	3.0	1.0	3.0

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Seventh		Course Category Code: PEC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA209	Environmental Impact Assessment and Audit	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Interpret knowledge on the impacts of various developmental project on environment						
	CO2	Interpret knowledge on various EIA methodologies and process						
	CO3	Decide the appropriate technologies to quantify the impacts on physical- chemical environment						
	CO4	Decide the appropriate technologies to quantify the impacts on Biological and Socio-Economic Environment						
	CO5	Develop knowledge on EIS, EMP and Environmental audit.						
UNIT-I	Introduction to EIA				Periods: 9			
Historical perspective of environmental protection laws and acts in India - Definition of EI, EIA, EIS - Industrial policy statement of the Government of India. Legal and Regulatory aspects in India - Types and Limitations of EIA - Minimum National Standards – Bureau of Indian Standards - WHO standards.							CO1	
UNIT-II	Methodologies				Periods: 10			
EIA methodologies – EIA processes- Appropriate Methodologies, Quantification, - Cost benefit analysis - Risk assessment, Test Model format - Preliminary survey and assessment							CO2	
Straw-Bale, Bamboo, Agro-Industrial Waste, Innovative Materials Developed by CBRI, SERC, Structural Properties of Alternate Building Materials, composite materials, artificial aggregates substitutes for natural conservation								
UNIT-III	Impact on Physical – Chemical Environment				Periods: 9			
Background - Typical considerations and factors, air quality impact of industry, transport systems, mitigation methods. Water quality impact: Water quality criteria and standards, Field Surveys -water quality- impacts by developmental projects –Land and soil quality impacts.							CO3	
UNIT-IV	Impact on Biological and Socio-Economic Environment				Periods: 10			
Energy impact considerations, data sources, energy conservation data, EIA of hydro, thermal and nuclear power plants, and new and renewable energy sources. Vegetation and Wild life impact: Biological concepts and terms, impact on flora and fauna, mitigating measures, alternatives.							CO4	
UNIT-V	Summarization of Environmental Impacts				Periods: 10			
Environmental Management plan, Public involvement - impacts of economic profile of the community, Exchange of information - comparison of alternatives-Training-Preparation of written documentations-Environmental Auditing – Environmental safety & health - Environmental Monitoring – EIA softwares and application to case studies							CO5	
Lecture Periods: 48		Tutorial Periods:- 0		Practical Periods: -0		Total Periods: 48		

Reference Books

1. Trivedi.P.R, Environmental Impact Assessment, APH Publishing, 2011.
2. Canter,L.W., Environmental Impact Assessment, McGraw Hill, 1996.
3. Petts, J., Handbook of Environmental Impact Assessment Vol.I and II, Blackwell Science, London, 1999.
4. Environmental assessment of development projects, United Nations Asia and Pacific Development Centre, Kuala Lumpur, 1983.
5. John, G. Rau and David C. Wooten (Ed), Environmental Impact Analysis Hand Book, McGraw Hill Book Co1980.

AAA209

Environmental Impact Assessment and Audit

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	-	-	1	-	-	-	-	1	2	-	-
CO2	2	3	-	2	2	2	1	-	-	-	2	3	2	-
CO3	1	3	1	3	2	1	1	-	-	-	1	2	1	-
CO4	1	2	1	2	2	2	1	-	-	-	2	3	1	-
CO5	2	1	1	2	2	3	1	-	-	-	1	2	1	-
Average	1.6	2.2	0.8	1.8	1.6	1.8	0.8	-	-	-	1.4	2.4	1.0	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Seventh		Course Category Code: PEC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA210	Disaster Management	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Explain the increasing vulnerability of the planet in general and India in particular to disasters						
	CO2	Infer the various categories of Disasters						
	CO3	Explain the responsibilities to society						
	CO4	Analyze Capacity Development in Disaster Management						
CO5	Create a basis to work towards preparedness and to develop a culture of safety and prevention							
UNIT-I	Introduction To Disaster Management					Periods: 9		
Definition- nature, characteristics and types of Disasters- Causes and effects, Disaster: A Global View- Disaster Profile of India- Disaster Management cycle.						CO1		
UNIT-II	Natural Disaster					Periods: 9		
Geological and Mountain Area Disasters -Earthquakes- Volcanic Eruption- Landslides-Snow Avalanches - Wind and Water Related Natural Disaster Floods and Flash Floods-Droughts- Cyclones Tsunamis						CO2		
UNIT-III	Manmade Disaster					Periods: 10		
Understanding Manmade Disasters- Fires and Forest Fires- Nuclear- Biological and Chemical disaster- Road Accidents						CO3		
UNIT-IV	Capacity Development In Disaster Management					Periods: 10		
Capacity building-Concept- Structural and nonstructural measures- Capacity assessment; strengthening capacity for reducing risk - Counter disaster resources and their utility in disaster management- Legislative support at the state and national levels-Coping strategies- Industrial safety plan						CO4		
UNIT-V	Strategies In Disaster Management					Periods: 10		
Strategies for disaster management planning- Steps for formulating a disaster risk reduction plan- Disaster management Act and Policy in India - Organisational structure for disaster management in India- Preparation of state and district disaster management plans						CO5		
Lecture Periods: 48		Tutorial Periods:- 0		Practical Periods: - 0		Total Periods: 48		
Reference Books								
1. Alexander, D. "Natural Disasters", ULC press Ltd, London, 1993. 2. Carter, W. N. "Disaster Management: A Disaster Management Handbook", Asian Development Bank, Bangkok, 1991. 3. Chakrabarty, U. K. "Industrial Disaster Management and Emergency Response", Asian Books Pvt. Ltd., New Delhi 2007 4. Abarquez I. & Murshed Z. "Community Based Disaster Risk Management: Field Practitioner's Handbook", ADPC, Bangkok, 2004. 5. Goudie, A. "Geomorphological Techniques", Unwin Hyman, London 1990. 6. Goswami, S. C. "Remote Sensing Application in North East India", Purbanchal Prakesh, Guwahati, 1997. 7. Manual on Natural Disaster Management in India, NCDM, New Delhi, 2001. 8. Disaster Management in India, Ministry of Home Affairs, Government of India, New Delhi, 2011.								

Graduate Attributes	Disaster Management												Graduate Attributes	
	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	1	2	1	2	3	-	2	-	2	2	2	2	-
CO2	-	1	1	1	2	3	-	2	-	1	2	1	1	-
CO3	-	1	1	2	1	3	-	-	-	1	2	2	2	-
CO4	-	1	2	1	2	3	-	2	-	2	1	3	3	-
CO5	-	1	2	2	1	2	-	2	-	3	-	3	3	-
Average	-	1.0	1.6	1.4	1.6	2.8	-	1.6	-	1.8	1.4	2.0	2.0	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Seventh		Course Category Code: PEC			Semester Exam Type: -TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA211	Earth Quake Resistant Structures	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO 1	Explain the elements of Engineering Seismology						
	CO 2	Illustrate the concepts of theory of vibration						
	CO 3	Illustrate the theory behind earthquake resistance of various structures						
	CO 4	Apply the knowledge on Code provisions of earthquake resistance.						
	CO 5	Solve problems in computation of design lateral loads						
UNIT-I	Elements of Engineering Seismology				Periods: 9			
Elements of engineering seismology - Characteristics of earthquake- earthquake size- plate tectonics – types of seismic waves – terms associated with earthquakes (Magnitude/Intensity of an earthquake-scales-Energy released - Earthquake measuring instruments-Seismic scope – seismographs , accelerograph) - effect of earthquake - earthquake history- seismicity zone of India.								CO1
UNIT-II	Theory of Vibrations				Periods: 10			
Theory of vibrations --formulation of equation of motion (Elements of a vibratory system- Degrees of Freedom-Continuous system-Lumped mass idealization-Oscillatory motion-Simple Harmonic Motion) - single degree of freedom system- free and forced vibrations (Response to harmonic excitation - Impulse and response to unit impulse - Duhamel integral) - damped and un damped vibrations - multiple degree of freedom systems - Decoupling of equations of motion - Concept of mode superposition (No derivations).								CO2
UNIT-III	Structural Systems				Periods: 10			
Principles of earthquake resistant design of RC members - frame buildings - Masonry Buildings - Structural Walls and Non-Structural Elements. Performance of structures under past earthquakes- lessons Learnt from past earthquakes--soil liquefaction - Principles of earthquake resistant design - Structural system requirements of buildings – Earthquake Resistant Masonry Buildings								CO3
UNIT-IV	Introduction to IS Codes				Periods: 10			
Behavior of reinforced concrete and steel elements under cyclic loading – ductility and energy dissipation- Introduction to Indian Standard Codes -IS:4326 – 2013 and IS13920-1993.-detailing for seismic resistance of beam-column joints, beams, columns and footings - Lateral load resisting systems								CO4
UNIT-V	Computation of Design lateral loads/ Introduction to Retrofitting				Periods: 9			
Design earthquake loads – equivalent static force procedure as per IS 1893 – 2016 – Load combinations –GOI guidelines on Seismic Retrofitting of Deficient Buildings and Structures.								CO5
Lecture Periods: 48		Tutorial Periods:- 0		Practical Periods: -0		Total Periods: 48		

Reference Books

1. Pankaj Agrarwal & Manish Shrikhande “Earthquake resistant Design of Structures” Prentice Hall of India Pvt Ltd. New Delhi, 2013
2. Duggal.S.K. Earthquake Resistant Design of Structures, Oxford University Press, 2014.
3. Leigh.W, Mario Paz. “Structural Dynamics – Theory & Computations”, Springer Verlag, 2010.
4. A K.Chopra, “Dynamics of Structures Theory and Applications to Earthquake Engineering” Prentice Hall of India (P) Ltd., 2008.
5. Pauley T and Priestley M.J.N, Seismic Design of Reinforced Concrete and Masonry Buildings, John Wiley & Sons, New York, 2012.
6. Stratta, J.L “Manual of seismic Design”, Pearson Education Ltd., 2004.
7. National Disaster Management Guidelines on “Seismic Retrofitting of Deficient Buildings and Structures” June 2014, National Disaster Management Authority ,Government Of India
8. IS:4326 – 2013 Earthquake Resistant Design And Construction Of Buildings - Code Of Practice, Bureau of Indian Standards

AAA211 Earth Quake Resistant Structures

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	1	-	3	3	-	-	-	-	2	2	-
CO2	3	2	1	1	-	3	3	-	-	-	-	2	2	-
CO3	3	2	1	2	-	3	3	-	-	-	-	2	2	-
CO4	3	2	1	2	-	3	3	-	-	-	-	2	2	-
CO5	3	2	1	2	-	3	3	-	-	-	-	2	2	-
Average	2.8	2.0	1.0	1.6		3.0	3.0					2.0	2.0	

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Seventh		Course Category Code: PEC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA212	Contemporary Building Materials	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Assess the need and importance of modern building materials and its advantageous over the conventional materials.						
	CO2	Perceive the advantages of Advanced concrete and composite reinforcement.						
	CO3	Interpret the significance of composite building materials						
	CO4	Interpret the Nano materials and its features.						
CO5	Perceive the features of digital and tensile materials.							
UNIT-I	Introduction				Periods: 9			
Introduction and need for ultra-performance materials in building design as a substitute to conventional material- - Newer application for special performance, thermal/ sound/ moisture protection, fitting, equipment and furnishing -- Properties of contemporary materials – multidimensional, repurposed, recombinant, intelligent, interfacial, transforming, etc.								CO1
UNIT-II	Advanced Concrete and Composite Reinforcement				Periods: 10			
Types of advanced concrete and its applications – Workability and mechanical properties, durability and reliability of advanced concrete materials -Manufacturing and application in buildings --- Bendable concrete, light transmitting concrete, translucent concrete, pervious concrete, eco- cement, etc.,								CO2
UNIT-III	Composite Materials				Periods: 9			
Use of composite materials namely Polymer Matrix Composites (PMCs) and Fiber- Reinforced Polymers (FRPs) along with cement, steel, aluminum, wood, glass, etc., for thermal insulation, fire protection, coating, painting and structural monitoring etc.								CO3
UNIT-IV	Nano-Materials and Nano-Composites				Periods: 10			
Definition, manufacture and types of nano materials. Properties, performance of nano materials in building construction, types and application of nano-materials like carbon, nano tubes etc.,--Nano composite used with cement, steel, Aluminium, wood, glass for thermal insulation, fire protection, coating and painting and structural monitoring etc. Nano technologies in building and construction.								CO4
UNIT-V	Digital And Tensile Materials				Periods: 10			
Types of materials and its constitution, manufacturing and construction technology requirement for 3D printed buildings structure and Extraterrestrial printed structures--- Tensile fabric structure by digital printing. Translucent fabric, thin-film photovoltaic, Teflon foil, PVC (poly vinyl chloride) coated polyester cloth and PTFE (poly tetra fluoroethylenes) (Teflon) -- coated glass cloth.								CO5
Lecture Periods: 48		Tutorial Periods:- 0		Practical Periods: -0		Total Periods: 48		

Reference Books
1. Christiane Sauer, 'Made of...New Materials Sourcebook for Architecture and Design', Prestel Pub,2010.
2. Mel Schwart, 'Encyclopaedia of Smart Materials -Vol 1,2', Wiley-Inter science, 2001.
3. SenemÖzgönülŞensan, 'Smart Materials and Sustainability: Application of Smart Materials in Sustainable Architecture', LAP Lambert Academic Publishing,2010.
4. Axel Ritter, 'Smart Materials in Architecture, Interior Architecture and Design',Birkhäuser Architecture,2002.
5. Michael. F. Ashby, Paulo Ferreira, Daniel L. Schodek, 'Nanomaterials, Nanotechnologies and Design: An Introduction for Engineers and Architects', Butterworth- Heinemann,2009.

AAA212 Contemporary Building Materials

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	-	-	1	-	-	-	-	1	2	2	-
CO2	2	3	1	-	2	2	1	-	-	-	2	3	3	1
CO3	2	2	2	-	2	1	1	-	-	-	1	2	1	-
CO4	-	2	1	-	2	2	1	-	-	-	2	2	1	-
CO5	2	1	2	-	2	3	1	-	-	-	1	2	2	1
Average	1.6	2.0	1.4	-	1.6	1.8	0.8	-	-	-	1.4	2.2	1.4	0.4

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture				Programme : B.Tech(Architectural Assistantship)				
Semester: Seventh				Course Category Code: PEC			Semester Exam Type:- TY	
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA213	Glass architecture and Design	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Utilize glass and its potential in contemporary usage						
	CO2	Design green buildings and energy efficient buildings.						
	CO3	Evaluate the green building concepts adopted in a building based on various parameters and tools.						
	CO4	Use the sun path diagram and its impact in a design of buildings.						
	CO5	Use and implement the various assessment tools to design a building						
UNIT-I	Glass as building material						Periods: 9	
-Applications of glass in buildings (façade/ interior applications). Understanding the production & properties of glass. - Types of Glass- mirror, lacquered, fire resistant. Modern glass with different applications. -Glass for hospitals, green homes, airports, offices, other buildings.							CO1	
UNIT-II	Glass and green architecture						Periods: 10	
Understanding of internal and external reflections. Day-lighting in Buildings - introduction and basic concepts (VLT). Solar Control and thermal insulation (SF, UV,SHGC). – Need for green Buildings. Energy efficient buildings. Achieving energy efficiency using glass. Factors of energy efficient material selection--- Performance parameters.							CO2	
UNIT-III	Case study						Periods: 9	
Case study of green building designed predominantly with energy efficient materials. – Calculations involving basic factors in glass design---Optimization of Glass-for wastage reduction and standardization of Design. Construction site/ green building visit report.							CO3	
UNIT-IV	Design workshops I						Periods: 10	
– Analyzing and creating building using interactive modelling. Analyzing of sun path, solar exposure building orientation, daylight, acoustics, site shadow analysis.							CO4	
UNIT-V	Design workshops II						Periods: 10	
- Current research in day lighting and case studies - Work of architects who have integrated daylight in a meaningful and effective way in the design of a building and Verify compliance of a building to known certification systems- Exercise: Visual Performance Assessment of Buildings.							CO5	
Lecture Periods:48		Tutorial Periods: 0		Practical Periods:0		Total Periods: 48		
Reference Books								
1. Christian Schittich, 'Glass Construction Manual', Birkhauser Basel,2007. 2. 'Architectural Glass Guide', Federation of Safety Glass,2013.								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	-	1	1	-	-	-	-	1	2	2	-
CO2	1	3	1	-	2	2	1	-	-	-	2	3	3	1
CO3	1	2	1	-	2	1	1	-	-	-	2	2	2	-
CO4	1	2	2	-	1	2	1	-	-	-	2	2	2	-
CO5	2	1	2	-	1	2	-	-	-	-	1	2	2	1
Average	1.4	2.0	1.4	-	1.4	1.6	0.6	-	-	-	1.6	2.2	2.2	0.4

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Seventh		Course Category Code: PEC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA214	Concepts And Approaches In Design	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Apply a personal, reflective and examined intellectual position in relation to design as a process of inquiry, thought and action.						
	CO2	Relate and infer the various processes involved in Design						
	CO3	Infer the qualities of Design problems and solutions						
	CO4	Analyze the implicit design-thinking involved in the design process of eminent architects and designers						
CO5	Develop different approaches to design problem solving							
UNIT-I	Design And Design Process						Periods: 10	
Definition of Design, Design in various fields - Design process and its uniqueness, Quality of the Design Process Introduction to Architectural Design, Stages of Design and Tools used in each of the stages - Diagrams as a tool for designing , Thinking with Sections and Views, How tools promote or restrict the design process, Idea Development – Role of Form, Importance of thinking in the third and fourth dimension.							CO1	
UNIT-II	Design Problem And Solutions						Periods: 10	
Nature of Design Problem, Design as a Wicked problem and its qualities.- Richard Buchanan - Nature of Design Solutions ,Design Traps for an Amateur Designer – Bryan Lawson -What is expected out of a designer - Abilities Designer must possess – Set of skills needed – Nigel Cross							CO2	
UNIT-III	Different Approaches To Design Problem Solving						Periods: 09	
Different approaches to design problem solving – Narrative Design – Examples, Fantasy Design – Examples, Symbolism–Examples							CO3	
UNIT-IV	Role Of Design Representations						Periods: 10	
Enquiry into Charles Correa’s housing language - Incrementality, Identity, Pluralism, Equity, Cost as priorities - Explanation of the Design Inquiry, Design thinking and Design action - Attempt to retrace the design process by conventional diagrammatic tools like Zoning, bubble diagrams etc. – Understanding the restriction of each tool .							CO4	
UNIT-V	Applications Of Design Process In Case Studies						Periods: 09	
Undertaking a critical enquiry on relevant readings of Case studies focusing on the Design Process							CO5	
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods: 0		Total Periods: 48		
Reference Books								
1. Edward De Bono, “Lateral Thinking”, Penguin Life, New York 2016								
2. Bryan Lawson, “How Designer’s Think”, Architectural Press Ltd, London 1980.								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1
CO1	-	1	1	-	1	2	-	2	1	2	-	2	2	-
CO2	-	1	1	1	2	-	-	2	-	1	-	3	1	-
CO3	-	1	0	1	1	2	-	2	-	2	-	2	2	-
CO4	-	-	1	-	1	2	-	2	-	3	-	2	3	-
CO5	-	1	1	-	1	2	-	2	-	3	-	3	3	-
Average	-	0.8	0.8	0.4	1.2	1.6	-	2.0	0.2	2.2	-	2.4	2.2	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Seventh		Course Category Code: PEC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA215	Services In High Rise Buildings	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Interpret the role of Service core and its components in the design of High-rise buildings.						
	CO2	Develop the safety measures, ventilation system and security surveillance in the design of High-rise buildings.						
	CO3	Integrate the design aspects of lift, escalator and electrical power distribution system for a multi storied building.						
	CO4	Integrate the building automation system in the design of High rise buildings.						
CO5	Develop a building management system for a multi storied building for its services, safety and security measures.							
UNIT-I	Service Core In Highrise Buildings						Periods: 9	
Introduction to high rise building and its components: Indian Standards and Global Standards on High Rise Buildings - Introduction to service sin high rise buildings -- Importance of Service Core Design - Design Criteria for Service Core, Components of Service Core, Various Service Core Configurations -Mechanical floor - tower parking systems - Vertical and Horizontal Ducts for various services.							CO1	
UNIT-II	Mechanical Services						Periods: 10	
Naturally and Mechanically assisted Ventilation Systems for high rise buildings--- Air Conditioning Systems for Multi-Zone, Multi-Storied Buildings --- Designing fire safety measures in high rise buildings-- Security Systems at site level & building level: Perimeter protection &Access Control.							CO2	
UNIT-III	Electrical And Transportation Services						Periods: 10	
Planning and Location of Electrical Rooms and power supply Distribution systems- Power Back-up Systems -Planning and Designing of Elevator Systems and Services – Express & Local Elevators, Sky lobbies, etc. --Escalators and Capsule elevators – Stairways & Ramps							CO3	
UNIT-IV	Plumbing Services & Solid Waste Disposal System						Periods: 10	
Types of Water Storage and Distribution Systems in high rise buildings--- Types of Sewage Collection Systems in high rise buildings-Standards of Sanitary Services in high rise buildings --Refuse Collection and Disposal-. Methods and types including solid waste collection and disposal							CO4	
UNIT-V	Integrated Building Management Systems						Periods: 9	
Introduction to Integrated Building Management systems (IBMS)various components of IBMS, List of utility, safety and security systems in general; Types of utility, safety and security systems and its installation. Energy management systems and building controls through IBMS.							CO5	
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods:0		Total Periods: 48		

Reference Books

1. Fred Hall & Roger Greeno, Building Services Handbook, Elsevier,2005.
2. A K Mittal, Electrical and Mechanical Services in High Rise Buildings Design and Estimation Manual, 2001
3. R.Barry, The Construction of Buildings, Volume 5, Affiliated East-West Press Pvt. Ltd.,New Delhi, 1999.
4. Building Automation Systems – A Practical Guide to selection and implementation –Author :Maurice Eyke
5. Mechanical and Electrical Services for High Rise Buildings: Handbook by Basem M. M. (Author)

AAA215

Services In High Rise Buildings

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	-	3	3	3	-	-	-	-	3	1	2
CO2	2	2	2	2	3	3	3	-	-	-	-	3	1	2
CO3	2	2	2	2	3	3	3	-	-	-	-	3	1	2
CO4	2	2	2	2	3	3	3	-	-	-	-	3	1	2
CO5	1	1	1	1	3	3	1	-	-	-	-	3	2	2
Average	1.8	1.8	1.6	1.8	3.0	3.0	2.6	-	-	-	-	3.0	1.2	2

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Seventh		Course Category Code: PCC			Semester Exam Type:- LB			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA129	Architectural Design -IV	0	0	6	3	25	75	100
Prerequisite		--						
Course Outcome		The Course will enable the student to perform a design of building that requires specialization and data collection						
CO1		Interpret the space standards for a hospital building in an Indian context.						
CO2		Design a Hospital Building on a proposed site conditions by incorporating the bye laws						
CO3		Interpret the space standards and bye laws for a three-star hotel building						
CO4		Design a three-star hotel building on a proposed site conditions and space requirement by incorporating the by laws						
CO5		Create a realistic model for a proposed design for demonstration.						
Unit-I	Hospital Building—Data Collection and Case Study					Periods: 18		
Definition of a Hospital Building—Space standards of a hospital building as per National Building Code, India—Preparation of Case study reports on existing Hospital Building in Indian context-					CO1			
Unit-II	Hospital Building—Design Phase					Periods: 20		
Space requirements for a proposed Hospital Building on an imaginary site in a city or town---Developing a flow chart and proximity table on various spaces and its degree of inter relationship—Concept and Scheme stage in the form of double line plans, sections and elevations					CO2			
Unit-III	Three Star Category Hotel Building—Data Collection and Case Study					Periods: 18		
Definition of Star categories in the Hotel Building—Space standards of a Star category building as per National Building Code, India and Tourism Department of India—Preparation of Case study reports on existing Three Star category Hotel Building in Indian context.					CO3			
Unit-IV	Three Star Category Hotel Building— Design Phase					Periods: 20		
Space requirements for a proposed Three Star category Hotel on an imaginary site in a city or town---Developing a flow chart and proximity table on various spaces and its degree of inter relationship—Concept and Scheme stage in the form of double line plans, sections and elevations					CO4			
Unit-V	Model Making					Periods: 20		
Creation of Hospital or Hotel building model along with site conditions using hard boards and other materials to represent the site along with necessary elements in suitable scale.					CO5			
Lecture Periods: 0		Tutorial Periods: 0		Practical Periods: 96		Total Periods: 96		

Reference Books

1. Joseph De Chiara, Michael J Crosbie, 'Time Saver Standards for Building Types', McGraw Hill Professional, 2001.
2. 'Ernst Neuferts Architects Data', Blackwell ,2002.
3. Stephen A. Kliment, Editor 'Building Type Basics' Series, Wiley.
4. Wolfgang Preiser, Korydon H. Smith, 'Universal Design Handbook', 2nd Edition, McGraw-Hill,2010.
5. NABH Accreditation standards for Hospitals , 5th Edition, April 2020

AAA129

Architectural Design -IV

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	2	2	2	1	3	3	2	-	3	-	2	3	3
CO2	-	2	3	3	3	3	3	2	-	3	-	3	3	3
CO3	-	2	2	2	1	3	3	2	-	3	-	2	3	3
CO4	-	2	3	3	3	3	3	2	-	3	-	3	3	3
CO5	-	2	1	-	1	-	-	-	-	-	-	-	3	3
Average	-	2.0	2.2	2.0	1.8	3.0	3.0	2.0	-	3.0	-	2.0	3.0	3.0

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture			Programme : B.Tech (Architectural Assistantship)					
Semester: Seventh			Course Category Code: PAC			Semester Exam Type:- --		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA130	Seminar	3	0	0	1	100	--	100
Prerequisite		--						
Course Outcome		The Course will enable the student to						
CO1		choose the topic interest in Architecture for the presentation.						
CO2		identify the advanced topics in Architecture for the presentation.						
CO3		prepare the conference papers as per the format given.						
CO4		improve the language of presentation						
CO5		identify the interdisciplinary and industrial application related topics						
Each one of the students will be assigned a Seminar Topic in the current and frontier Areas. The Student has to conduct a detailed study/survey on the assigned topic and prepare a report. The student will make an oral presentation followed by a brief question and answer session. The Seminar (presentation and report) will be evaluated by an internal assessment committee for a total of 100 marks.								CO1 CO2 CO3 CO4 CO5
Lecture Periods: --		Tutorial Periods:- --		Practical Periods: 48		Total Periods: 48		

AAA130 Seminar

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	1	-	-	-	1	-	-	-	-	1	2	-
CO2	1	-	1	-	1	-	1	1	1	-	-	1	1	-
CO3	1	-	1	-	3	-	1	1	3	-	-	2	-	-
CO4	2	-	-	-	2	-	-	-	2	-	-	1	1	-
CO5	-	-	-	-	2	-	-	1	2	-	-	1	2	-
Average	0.8	-	0.6	-	1.6	-	0.6	1.2	1.6	-	-	1.2	2.2	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Seventh		Course Category Code: MCC			Semester Exam type: --			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA131	Professional Practice, Law & Ethics	3	0	0	Non-Credit	-	-	-
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Develop higher ethical standards.						
	CO2	Build moral values and Ethics and overcome conflict of interest						
	CO3	Explain the types of services rendered by an Architect.						
	CO4	Take part in the process of tenders and contracts.						
	CO5	Develop ethics in research and publications.						
UNIT-I	Ethics - Ethical Behaviour				Periods: 9			
Ethics - Ethical Behavior: Moral Sensitivity – Moral Judgement – Moral Motivation – Moral Courage. Ethical Decision Making – Check points – Steps – Moral Compass							CO1	
UNIT-II	Professional Ethics as applied to Engineering				Periods: 9			
Professional Ethics as applied to Engineering – Characteristics of Professional and Professional Ethics – Engineering Ethics. Professional Code of Ethics – IEI&NSPE							CO2	
UNIT-III	Role of an architect & services rendered				Periods: 11			
Architect's role in society, IIA code of conduct, salient features of architect's act 1972, the council of architecture – Architect's office and its management, elementary accountancy required for the same etc. Architectural services- conditions of agreement- scope of work, comprehensive architectural services- conditions of engagement, remuneration, professional fees and charges as per IIA norms.							CO3	
UNIT-IV	Tenders & contracts				Periods: 9			
Calling for Tenders- tender documents, open & closed tenders, various types such as item rate, lump sum, labour & demolition tenders, conditions of tender- submission, scrutiny, recommendations & award of contract- Conditions of contract, IIA form of contract, articles of agreement- certification of contractor's bills, defects liability. Earnest money deposit, security money deposit etc.							CO4	
UNIT-V	Ethics in research and publication				Periods: 6			
Authorship in scientific research, plagiarism, guidelines for research and publication.							CO5	
Lecture Periods: 48		Tutorial Periods:0		Practical Periods:0		Total Periods: 48		
Reference Books								
1. Charles E Harris Jr, Michael S Pritchard, Michael J Rabins, Engineering Ethics Concepts and Cases, Cengage Learning 2012.								
2. Mike W.Martin, Roland Schinzinger, Ethics in Engineering, Tata MaGraw Hill Education (P) Ltd., 2012								
3. Hand book on Professional Practice by I. I. A, Image systems, Mumbai,1998.								
4. CMDA-Development control rules for CMA.								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1
CO1	-	1	-	-	1	1	-	-	-	-	1	2	1	-
CO2	1	1	-	1	2	2	1	-	-	-	1	3	-	-
CO3	1	1	-	3	2	1	1	-	-	-	2	2	2	-
CO4	2	2	-	2	2	2	3	-	-	-	1	2	2	-
CO5	-	-	-	2	2	2	1	-	-	-	1	2	-	-
Average	0.8	1.0	-	1.6	1.8	1.6	1.2	-	-	-	1.2	2.2	1	-

Mapping Correlation	Low	Medium	High
	1	2	3

VIII SEMESTER

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Eighth		Course Category Code: PAC				Semester Exam Type:-		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA132	Comprehensive Test	0	0	2	1	100	--	100
Prerequisite		--						
Course Outcome		The Course will enable the student to						
CO1		attend the various Competitive examinations etc.						
CO2		Analyze independently the problems in Architecture and Civil Engineering						
CO3		Identify the relevant Indian Standards for the various projects of Architecture and Civil Engineering						
CO4		link the subjects Learned with the associated problems in Architecture and Civil Engineering projects.						
CO5		identify the Learning gaps in the Architecture and Civil Engineering subjects						
The student will be tested for his understanding of basic principles of the core Architecture and Civil Engineering subjects. The internal assessment will be made by an internal assessment committee. The committee will conduct two written examinations of objective or short questions type from the all the core subjects.								CO1 CO2 CO3 CO4 CO5
Lecture Periods: --		Tutorial Periods:- --		Practical Periods: 32		Total Periods: 32		

AAA132 Comprehensive Test

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-		1	-	-	1	1	-	-	-	-	1	2	1
CO2	1		1	-	1	2	2	1	-	-	-	1	3	-
CO3	1		1	-	3	2	1	1	-	-	-	2	2	2
CO4	2		2	-	2	2	2	3	-	-	-	1	2	2
CO5	-		-	-	2	2	2	1	-	-	-	1	2	-
Average	0.8		1.0	-	1.6	1.8	1.6	1.2	-	-	-	1.2	2.2	1

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Eighth		Course Category Code: PAC				Semester Exam Type:-		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA133	Internship	0	0	0	2	100	--	100
Prerequisite		--						
Course Outcome		The Course will enable the student to						
		CO1	Analyze independently the problems in Architecture& Civil Engineering					
		CO2	develop the innovation with the associated Architecture& Civil Engineering Projects					
		CO3	identify the Learning gaps in the Curriculum at the Architecture& Civil Engineering Project works.					
		CO4	Take part in office procedure effectively and work with multidisciplinary teams.					
		CO5	Apply the techniques, skills, and modern engineering tools necessary for the Architecture& Civil Engineering Projects.					
The student will be tested for his understanding of basic principles of the core Architecture& Civil Engineering subjects in the associated Architecture& Civil Engineering Projects during the internships. The evaluation is through internal assessment only. A committee constituted and approved by the controller of examination comprising of two faculty members of the Department will assess the internship, based on the report and the oral presentation of the student.							CO1	
							CO2	
							CO3	
							CO4	
							CO5	
Lecture Periods: --		Tutorial Periods:- --		Practical Periods: --		Total Periods: --		

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1
CO1	-		1	-	-	1	1	-	-	-	-	1	2	3
CO2	1		1	-	1	2	2	1	-	-	-	1	3	3
CO3	1		1	-	3	2	1	1	-	-	-	2	2	3
CO4	2		2	-	2	2	2	3	-	-	-	1	2	3
CO5	-		-	-	2	2	2	1	-	-	-	1	2	3
Average	0.8		1.0	-	1.6	1.8	1.6	1.2	-	-	-	1.2	2.2	3

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Eighth		Course Category Code: PAC				Semester Exam Type:- PR		
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA134	Project Work	0	0	8	8	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	choose a topic of project work in the subjects Learned in Architecture& Civil Engineering.						
	CO2	develop the project work as multidisciplinary						
	CO3	Formulate the topics as application oriented						
	CO4	Take part effectively and work with the team members.						
	CO5	perceive the problems and to find suitable solutions						
The objective of the design project is to enable the students to work in groups of not more than four members in each group on a project involving analytical, experimental , design or combination of these in the Area of Architecture& Civil Engineering. Each project shall have a guide. The student is required to do literature survey, formulate the problem and form a methodology of Arriving at the solution of the problem. The evaluation is based on internal and external evaluation committee.								CO1 CO2 CO3 CO4 CO5
Lecture Periods: --		Tutorial Periods:- --			Practical Periods: - 128		Total Periods: - 128	

Graduate Attributes	Project Work												PSO1	PSO2
	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning		
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-		1	-	-	1	1	-	-	-	-	1	2	-
CO2	1		1	-	1	1	2	1	-	-	-	1	3	1
CO3	1		1	-	3	-	1	1	-	-	-	2	2	1
CO4	2		2	-	2	2	1	3	-	-	-	1	2	3
CO5	-		-	-	2	2	2	-	-	-	-	1	2	-
Average	0.8		1.0	-	1.6	1.8	1.6	1.0	-	-	-	1.2	2.2	0.8

Mapping Correlation	Low	Medium	High
	1	2	3

OPEN ELECTIVES

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Third		Course Category Code: OEC			Semester Exam Type: -TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA301	Art and Architecture	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Relate the visual & aesthetic qualities of fine Arts to Architectural Design.						
	CO2	Discover the basic elements of design.						
	CO3	Discover the visual and emotional impacts of geometrical forms.						
	CO4	Examine the basic principles of aesthetics.						
CO5	Analyze the properties of colours.							
UNIT-I	Introduction						Periods: 09	
Brief historical review of development of fine arts viz. visual and performing arts - Interdependency of visual arts, architecture, painting and sculpture.							CO1	
UNIT-II	Elements of design						Periods: 09	
Introduction to basic elements of design–point, line, plane and form.							CO2	
UNIT-III	Visual properties of forms						Periods: 10	
Study of visual properties of 3-Dimensional geometrical forms – sphere, cube, pyramid, cylinder and cone.							CO3	
UNIT-IV	Principles of aesthetics						Periods: 10	
Principles of aesthetics and their role in architectural expression - Introduction to principles of organization/composition - Repetition, Variety, Radiation, Rhythm, Gradation, Emphasis & Subordination, Proportion, Harmony and Balance.							CO4	
UNIT-V	Study of colours						Periods: 10	
Study of classification of colours with different hues, values, and shades - Colour wheel and colour composition - properties of colours.							CO5	
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods: 0		Total Periods: 48		
Reference Books								
1. Francis D.K. Ching, “Architecture-Form, Space and Order”, Van Nostrand Reinhold Company, New York, 2007. 2. Pramod V.S., “Design Fundamentals in Architecture”, Somaiya Publications Private Ltd., New Delhi, 1973. 3. Patti Mollica, “Color Theory: An Essential Guide to Color - from Basic Principles to Practical Applications”, Walter Foster Publishing, Beverly, 2013								

Graduate Attributes	Course Outcomes												PSO1	PSO2
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
Engineering knowledge	-	-	-	-	-	-	-	-	-	1	-	2	-	-
Problem analysis	-	-	-	-	-	-	-	-	-	1	-	2	-	-
Design/Development of Solutions	-	-	-	-	-	-	-	-	-	1	-	3	-	-
Conduct investigations of complex problems	-	-	-	-	-	-	-	-	-	2	-	2	-	-
Modern tool usage	-	-	-	-	-	-	-	-	-	3	-	2	-	-
The engineer and society	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Environment and sustainability	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethics	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Individual and team work	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Communication	-	-	-	-	-	-	-	-	-	1.6	-	2.2	-	-
Project management and finance	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Life-long learning	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Third to Seventh		Course Category Code: OEC			Semester Exam Type: TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P	C	CA	SE	TM
AAA302	Interior Design	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to perform a design of building that requires specialization and data collection							
	CO1	Prepare Interior design proposals for the Kitchen & Bedroom in a residential building						
	CO2	Interpret the Interior design space standards for the Living Hall in a residential building						
	CO3	Choose an appropriate material for the floors, walls and ceilings in the interior design of a residential building.						
	CO4	Choose the suitable furniture and other accessories for the interiors of a residential building.						
	CO5	Prepare an interior design of a Living, kitchen & Bedroom in a residential building						
Unit-I	Kitchen & Bedroom—Data Collection & Design					Periods: 10		
Kitchen--- Space Standards recommended in NBC ---Work Triangle concept--- Dimensional aspects of Sink, Stove/ Range and Storage shelves / Refrigerator. – Bedroom--- Space Standards recommended in NBC --Furniture used in the Bedroom—Wardrobe details--Lighting and Ventilation required for a kitchen & Bedroom. Preparation of interior design proposals for a kitchen / bedroom						CO1		
Unit-II	Living Hall--- Data Collection & Design					Periods: 10		
Living Hall--- Space standards recommended in NBC—Furniture used in Living hall--- Activities and Functions of a Living hall---Lighting and Ventilation required for a Living hall—Preparation of interior design proposals for a living hall						CO2		
Unit-III	Finishes for the Floors, Walls and Ceilings					Periods: 09		
Types of Floors—Various materials used for flooring—Various types finishes for the walls—wall paneling—various types of paints—Color schemes for various spaces in a residential building—False Ceilings--- Home theater concepts						CO3		
Unit-IV	Furniture					Periods: 09		
Furniture—various types of furniture—Various aspects for the selection of material for furniture---Functional and aesthetical aspects of furniture--- readymade and built in furniture—Components of modular furniture--Modular furniture for Kitchen worktop cabinets and bedroom wardrobes--						CO4		
Unit-V	Accessories and Interior Landscape elements					Periods: 10		
Wall hangers—Murals—Artifacts—Chandelier—Interior Landscape elements— Interior Water scape elements—Design of courtyard spaces						CO5		
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods: 0		Total Periods: 48		

Reference Books

1. Joseph De Chiara, Michael J Crosbie, 'Time Saver Standards for Building Types', McGraw Hill Professional, 2001.
2. 'Ernst Neuferts Architects Data', Blackwell ,2002.
3. Illustrated Interior Desing by Ching
4. Interior Design : Principle and Practice by M.Pratap Roa
5. Design the Home you love—An interior Design Book by Lee Mayor and Emily Motayed

AAA302

Interior Design

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	2	3	2	2	3	2	-	-	3	1	3	-	3
CO2	-	3	3	2	3	3	3	3	-	3	3	3	-	3
CO3	-	2	2	2	2	3	2	-	-	3	1	3	-	3
CO4	-	3	3	2	3	3	3	3	-	3	3	3	-	3
CO5	-	-	1	-	1	-	-	-	-	-	-	-	-	3
Average	-	2.0	2.4	1.6	2.2	2.4	2.0	1.8	-	2.4	1.6	2.4	-	3.0

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Fifth		Course Category Code: OEC			Semester Exam Type:- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA303	Kitchen design	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Discover the basic principles of kitchen design.						
	CO2	Discover the various types of kitchen.						
	CO3	Examine kitchen fitments, fixtures and finishes.						
	CO4	Examine the health and safety measures in kitchen design.						
CO5	Analyze the estimation, costing and establishment of kitchen.							
UNIT-I	Introduction						Periods: 09	
Brief historical review of kitchen design evolution - kitchen work zones, the work triangle, and visual balance.							CO1	
UNIT-II	Types of kitchen						Periods: 09	
Types of kitchen layouts - Straight Kitchen, "L"- Shaped Kitchen, "C"- Shaped Kitchen, Parallel Kitchen, Island Kitchen, Peninsula Kitchen, Horseshoe Kitchen.							CO2	
UNIT-III	Kitchen fitments, fixtures and finishes						Periods: 10	
Knife sets, measuring tools, strainers, cookware, kitchen equipments, other kitchen tools – modular kitchen fittings, kitchen furniture, sinks, wardrobe fittings, bins - Material selection & applications and Color theory application.							CO3	
UNIT-IV	Health and safety measures						Periods: 10	
Ventilation, lighting, space and flow of a kitchen, safe equipments, general safety and cleanliness, slip-resistant flooring, fire extinguisher, installation of electrical switches, plugs and lighting fixtures away from water sources and wet hands, rounded corners for countertops							CO4	
UNIT-V	Estimation, costing and establishment of kitchen						Periods: 10	
Creating an accurate estimate based on the client's needs, discussing different estimating and pricing strategies or methods and identifying hidden costs, identify everything included in a kitchen project by using the proper Specification and Installation list, establishment of kitchen organization, post establishment of kitchen organization, measures, understanding the quality inspection measures and final completion of work environment.							CO5	
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods: 0		Total Periods: 48		
Reference Books								
1. Charlotte Baden-Powell Routledge, "Architect's Pocket Book of Kitchen Design", Routledge Pocket Books, New York, 2005.								
2. Heather J. Paper, "All New Kitchen Ideas That Work", Taunton Press Inc., Newtown, 2018.								
3. Barbara Sallick, "The Perfect Kitchen", Rizzoli, New York, 2020								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	2	-	-	-	-	1	-	2	3	-
CO2	-	1	-	-	1	2	-	-	-	1	-	1	3	-
CO3	-	1	1	-	1	3	-	-	-	1	2	1	3	-
CO4	-	-	1	-	1	2	-	-	-	2	2	1	2	-
CO5	-	1	1	-	1	-	-	-	-	3	2	1	2	-
Average	-	0.6	0.6	-	2	1.4	-	-	-	1.6	1.2	1.2	2.6	-

Mapping Correlation	Low	Medium	High
	1	2	3

Department: Architecture		Programme : B.Tech (Architectural Assistantship)						
Semester: Third to Seventh		Course Category Code: OEC			Semester Exam Type --- TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA304	Lighting in Buildings	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Design a building with natural lighting by providing necessary doors, windows and glass fixtures.						
	CO2	Design the lighting scheme for a Living Hall in a residential building.						
	CO3	Propose the suitable lamps for an interior spaces in a building.						
	CO4	Propose the illumination level and light fittings for interiors as per design standards.						
	CO5	Propose a lighting scheme for residence, restaurant and office buildings integrating direct and indirect as per the need of an user.						
Unit-I	Natural Lighting					Periods: 10		
Lighting--- Units of measurement – Lux, candela, Luminous flux - Types of lighting - Natural and Artificial Lighting – Requirements of good lighting -- Day light factors – Day light Penetration – Aims of good lighting –Principles of openings to afford good lighting						CO1		
Unit-II	Artificial Lighting					Periods: 10		
Necessity of artificial lighting -Types of Artificial lighting—Ambient, Task and Accent Lighting-- luminaries – Aspects to be considered for the selection of a light source—Luminous Flux-Correlated Colour Temperature--Colour rendering Index (CRI)—Luminous Efficacy---Criteria to be considered for the selection of lamps.						CO2		
Unit-III	Various Types of Lamps					Periods: 09		
Types of Lamps and their Characteristics--incandescent lamps, Tungsten Halogen Lamp----Fluorescent bulbs-- Mercury Vapor lamps— Compact Fluorescent Lamp- Energy Efficient lighting –LED Lamps-Neon Lamps- Light fittings						CO3		
Unit-IV	Illumination levels required for various spaces in a building					Periods: 09		
Illumination levels required for various spaces in a residential building, office and Institutional building as per standards—method of lighting—selection of suitable light source—light fittings—Light control systems						CO4		
Unit-V	Lighting Schemes					Periods: 10		
Types of Lighting schemes---Direct and Indirect lighting schemes---Design a Lighting schemes of a residence, restaurant and office buildings through calculations with reference to the standards along with layout drawings.						CO5		
Lecture Periods: 48		Tutorial Periods: 0		Practical Periods: 0		Total Periods: 48		
Reference Books								
1.National Building Code of India (NBC). 2.IES Lighting Handbook: The Standard Lighting Guide by Illuminating Engineering Society 3.Lighting in architectural design ; Author: Derek Phillips ; Edition: View all formats and editions ; Publisher: McGraw-Hill, New York 4. Architectural Lighting: Designing With Light And Space ... Princeton Architectural Press, 2013 5.Interior Lighting for Designers FOURTH EDITION Gary Gordon FIES, FIALD, LC Illustrations by Gregory F. Day, John Wiley & Sons, Inc.								

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and financeq	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	-	-	-	-	-	-	-	-	-	-	2	-
CO2	1	1	2	1	3	3	-	-	-	-	-	1	2	2
CO3	3	1	2	3	3	2	-	-	-	-	-	-	2	2
CO4	3	3	3	2	3	3	-	-	-	-	-	1	2	2
CO5	3	2	3	1	3	-	-	-	-	-	-	1	3	3
Average	2.4	1.4	2.0	1.4	2.4	1.6	-	-	-	-	-	0.6	2.2	1.8

Mapping Correlation	Low	Medium	High
	1	2	3

Department : Architecture		Programme : B.Tech. (Architectural Assistantship)						
Semester : Seventh		Subject Category: OEC			Semester Exam Type: - TY			
Course Code	Course	Periods/ Week			Credit	Maximum Marks		
		L	T	P		C	CA	SE
AAA305	Ornamental Gardens for Home	3	0	0	3	25	75	100
Prerequisite	--							
Course Outcome	The Course will enable the student to							
	CO1	Interpret the role of landscape design and Ecology as well as in the micro scale of shaping of outdoor environments.						
	CO2	Interpret the elements of landscape design and their scope.						
	CO3	Make use of water and various plants in landscape.						
	CO4	Develop a design knowledge for soft landscape.						
	CO5	Develop a design knowledge for hard landscape.						
UNIT-I	Introduction				Periods: 09			
Definition, importance, need and scope-Basics of ornamental gardening -objectives -principles involved – components of ornamental gardens -Landscape and ecology, environmental impact assessment .								CO1
UNIT-II	Elements of Landscape Design:				Periods: 09			
Elements ornamental gardens – garden elements land form plants and planting, . Factors to be considered in Landscape Design – Land Form – Influence of existing land form, soil, topography, contour levels, drainage, vegetation etc. in Landscape Design. Landscape elements – Land, Water and Vegetation. Land & Landform: Importance of Land & Landform – Grading – Use of Land and Land form as Landscape Element.								CO2
UNIT-III	Water and selection of plants				Periods: 10			
Water : Various Forms of Water such as Water Falls, Water Channels as Landscape Element i.e. Aquascapes - Water Fountains, Water Cascades etc. Vegetation: Plant as a Landscape Element - Structural and Visual characteristics of plants- Plant Database for Tropical Conditions – Selection of Plants – Importance of Water and Plants in Landscape Design – Plants as Landscape Element								CO3
UNIT-IV	Soft landscape				Periods: 10			
Types of Plants: Trees, Shrubs & Hedges, Climbers & Wall shrubs, Ground covers, Herbaceous plants & Shrubs, Grasses. Plant Selection Criteria: Form, Texture, Colour Scent, Sound								CO4
UNIT-V	Hard landscape				Periods: 10			
Site Furniture: Seating, Shelter, Convenience elements, Information, Lighting, Traffic control & Protection, Utilities, Purpose of water display, Types of water effects, Operating systems Outdoor Lighting: General design principles, Lamp characteristics, Light Distribution, Categories of light fixtures, Landscape lighting effects.								CO5
Lecture Periods: 48		Tutorial Periods: - 0		Practical Periods: - 0		Total Periods: 48		

Reference Books

1. T S S for Landscape Architecture, Mc Graw Hill, Inc, 1995.
2. Grant W Reid, From Concept to Form in Landscape Design, Van Nostrand Reinhold Company, 1993.
3. Brian Hackett, Planting Design.
4. T.K. Bose and Chowdhury, Tropical Garden Plants in Colour, Horticulture And Allied Publishers, Calcutta, 1991.
5. Motloch, J.L., Introduction to Landscape Design”, Van Nostrand Reinhold Publishing Co., New York, 1991.

AAA305 Ornamental Gardens for Home

Graduate Attributes	Engineering knowledge	Problem analysis	Design/Development of Solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Graduates of the program should have the essential technical knowledge and skills to work in the firms of architects and civil engineers.	Graduates of the program exhibit computer drafting, the modern tools to work and practice in a world that is undergoing rapid developments and transitions in technology
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	-	-	-	2	3	-	-	-	-	-	-	-
CO2	-	-	-	-	-	2	-	-	-	-	-	1	2	1
CO3	-	-	-	-	-	-	3	-	-	-	-	3	-	-
CO4	2	3	-	3	-	2	3	-	-	-	3	3	1	-
CO5	2	3	-	3	-	2	3	-	-	-	3	3	-	3
Average	1.2	1.2	-	1.2	-	1.6	2.4	-	-	-	1.2	2.0	1.2	0.8

Mapping Correlation	Low	Medium	High
	1	2	3