Session: 2022-2023

OBE Curriculum of
Department of Architecture
Shahjalal University of Science and Technology, Sylhet, Bangladesh

PART A

OBE Curriculum of
Department of Architecture
Shahjalal University of Science and Technology, Sylhet, Bangladesh

OBE Curriculum of
Department of Architecture
Shahjalal University of Science and Technology, Sylhet, Bangladesh

1. Title of the Academic Program
Bachelor of Architecture

2. Name of the University
Shahjalal University of Science and Technology, Sylhet

3. Vision of the University
To emerge as an institute of eminence in the fields of engineering, technology business and management in serving the industry and the nation by empowering students with a high degree of technical, managerial and practical competence.

4. Mission of the University
M1. To strengthen the theoretical, practical and ethical dimensions of the learning process by fostering a culture of research and innovation among faculty members and students.

M2. To encourage long-term interaction between the academia and industry through the involvement of the industry in the design of the curriculum and its hands-on implementation

M3. To strengthen and mould students in professional, ethical, social and environmental dimensions by encouraging participation in co-curricular and extracurricular activities.

5. Name of the Faculty offering the program
School of Applied Sciences and Technology

6. Name of the Department offering the program
Department of Architecture

7. Vision of the Department:
This program will strive to play an essential and innovative role in enhancing the living environment condition by promoting architecture education through professionals.

8. Mission of the Department:
The Bachelor of Architecture program offers students professional degree to practice architecture. Mission of this program is:

M1. To produce skilled professionals with cultural consciousness and artistic intellect, committed to society and culture.

M2. To empower the students to critically engage the complexities of society and the natural environment by inspiring the fundamental principles of design.

M3. To make the students proficient with the latest communication, representation and technical knowledge in professional practice and instill professional and ethical responsibility.

9. Name of the Degree / Program

Bachelor of Architecture (B. Arch)

10. Description of the Program
The Department of Architecture offers one distinct undergraduate degree, which is the five-year Bachelor of Architecture (B.Arch.). Curriculum centers on the design studio and culminates in a year-long research and design project. Computing, theoretical, technological, and historical issues are progressively integrated into the design projects beginning in the first year. Projects range in scale and form, but relate to issues in contemporary culture with a focus on globalization and urban contexts. The curriculum of the Department of architecture is based on the general requirements of higher education scientific faculties and, at the same time, draws from the particular social needs. The curriculum also focuses on design application and production as they evolve both in the immediate milieu of professional architectural practice in Bangladesh and abroad, under the influence of political, social, financial and cultural transformations.

11. Program Accreditation
Department of architecture, SUST is accredited by the Institute of Architects Bangladesh (IAB).

12. Graduate Attributes and knowledge area:

The Program provides students with training in architectural design and related technical and academic knowledge. Students are provided with knowledge from multiple disciplines related with Program Objectives and Intended Learning Outcomes. All the courses are designed to cover nine thematic areas including both lectures and practical sessions. The following areas are:

1. Design and planning
2. Presentation and communication
3. History, heritage and theory
4. Building technology
5. Environmental design
6. Urban design
7. Project management
8. Sustainable design
9. Professional ethics

13. Area of professional contribution

Major objective of the program is to train professional architects. Besides that, graduates can contribute in various field considering their own interest. Students graduating from program can contribute in different professional fields related to

build environment. This program can also give students to develop skill in other creative sectors. After finishing this program graduates can achieve professional competence to work as (though not limited to):

1. Architect
2. Interior architect
3. Planner
4. Architectural conservator
5. Researcher
6. Community architect
7. Architecture education
8. Architectural critic
9. Environmental professional
10. Art and graphics designer
11. Construction/Project manager
12. Facility planner
13. Landscape designer
14. Visualization artist and photographer

14. Program Educational Objectives (PEO)

The Bachelor of Architecture program aims:

PEO 1: To equip students with necessary skills to practice context-based architecture with an emphasis on methodological design process, with deeper understanding on local environment, climate, society and economy.

PEO 2: To acknowledge architecture as a part of cultural study by growing intellectual awareness towards world history and civilization, allow students to recognize both tangible and intangible forces behind shaping architecture.

PEO 3: To make the students competent to apply state of the art computer technologies and tools in architectural design process and communication. Students will be trained with adequate fundamental knowledge in structural analysis and construction methods required for architectural design.

PEO 4: To aware the students of legislative issues of architectural design such as building laws, accreditation code and introduce ethical perspective of professional practice and train to be a responsible social being.

PEO 5: To promote students with creative skills and aesthetic perception towards various medium of arts related to build environment.

PEO 6: To develop leadership skill among students to work in a multidisciplinary scenario, prove as an effective team person with communication and presentation ability.

15. Program Learning Outcomes (PO)

The department have identified following Intended Program Learning Outcomes (PO) of graduated students. After successful completion of degree, students will be able:

	Key Area	A. Fundamental Skills
PO 1	Theory	To possess sufficient fundamental skills to begin professional careers in architectural practice and related fields.
PO 2	Design Method	To understand diversity of needs, values, behavioral norms, economy, in process of architectural design.
PO 3	Research	To apply architectural research methods in design process and conduct research works by using qualitative and quantities analytical approach.
		B. Social Skills
PO 4	Ethics	To recognize and perform social and ethical responsibility through practice of creation and professional commitment.
PO 5	Leadership	To shows leadership skill to work in multidisciplinary environment and as an effective team member with various professionals.
		C. Thinking Skills
PO 6	Problem Solving	To achieve problem solving skills though design addressing social, cultural, environmental, technological diversity with relation to built environment.
PO 7	Critical Thinking	To demonstrate critical thinking in process of art and architectural design with references to other mediums or art.
		D. Personal Skills
PO 8	Technology	To comprehend Building Technology, including the technical aspects of design, computation application, systems and materials.
PO 9	Communication	To demonstrate competency in architectural representation from a selection of drawings, physical and digital models, written statements and verbal presentations.

16. Mapping of University's Mission with PEO

MISSION STATEMENTS	PEO1	PEO2	PEO3	PEO4	PEO5	PEO6
M1	3	1	3	3	2	1
M2	3	1	3	3	2	2
M3	1	1	1	3	3	3

17. Mapping of PEO with PO

No	Program Educational Objectives	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6
PO 1	To possess sufficient fundamental skills to begin professional careers in architectural practice and related fields.	3	2	3	3	3	1
PO 2	To understand diversity of needs, values, behavioral norms, economy, in process of architectural design.	3	3	1	1	3	2
PO 3	To apply architectural research methods in design process and conduct research works by using qualitative and quantities analytical approach.	2	2	2	2	3	1
PO 4	To recognize and perform social and ethical responsibility through practice of creation and professional commitment.	3	1	1	3	3	3
PO 5	To shows leadership skill to work in multidisciplinary environment and as an effective team member with various professionals.	3	1	1	1	2	3
PO 6	To achieve problem solving skills though design addressing social, cultural, environmental, technological diversity with relation to build environment.	3	3	2	1	2	1
PO 7	To demonstrate critical thinking in process of art and architectural design with references to other mediums or art.	3	3	1	3	3	2
PO 8	To comprehend Building Technology, including the technical aspects of design, computation application, systems and materials.	2	1	3	1	1	1
PO 9	To demonstrate competency in architectural representation from a selection of drawings, physical and digital models, written statements and verbal presentations.	3	2	3	2	1	1

PART B

OBE Curriculum of
Department of Architecture
Shahjalal University of Science and Technology, Sylhet, Bangladesh
Department of Architecture
Undergraduate Program
Session 2022-2023

Structure of the B.Arch curriculum

Years Required for B Arch Degree	5	years
Total Semesters	10	semesters
No. of Course Streams	9	
Total Credits Required for B Arch Degree	174	credits
Compulsory Courses Required	158	credits
Optional Courses Required	16	credits
Total Credits Offered	209	credits
Total No. of Course	80	
Credits for B. Arch Thesis	10	credits
Total class weeks in a semester	14 weeks	
Minimum CGPA requirements for graduation	2.00/4.00	
Maximum academic years for completion	5 years	

B.Arch Program Course Streams

No	Area of Study	Offered in
Stream 1	**General Education**	**46 credits**
ENG 0231 1111A	English Language	1-1
ENG 0231 1112A	English Language (Lab)	1-1
MAT 0541 1113A	Mathematics	1-1
PHY0533 1211A	Physics for Architects	1-2
SSS 0222 1213A	History of the Emergence of Independent Bangladesh	1-2
CEE 0732 2111A	Structure I - Basic Mechanics	2-1
CSE 0613 2113A	Introduction to Programming With Python	2-1
CEE 0732 2211A	Structure II - Mechanics of Solids	2-2
SOC 0314 2213A	Principles of Sociology	2-2
ECO 0311 2215A	Principles of Economics	2-2
CSE 0613 2214A	Introduction to Programming With Python	2-2
CEE 0732 3111A	Structure III – Building Structures I	3-1
MEE 0715 3113A	Building Services I- Mechanical	3-1
ANP 0314 3115A	Culture, Space and Place	3-1
STA 0542 3117A	Statistics for Architects	3-1
CEE 0732 3211A	Structure IV – Building Structures II	3-2
EEE 0713 3213A	Building Services II - Electrical	3-2
CEE 0732 4211A	Construction Management	4-2
Stream 2	**History & Theory of Architecture**	**20 credits**
ARC 0731 1121	Art and Architecture I: Ancient civilizations	1-1
ARC 0213 1123	DT I: Aesthetics and Art Appreciation	1-1
ARC 0731 1221	Art and Architecture II: Medieval Europe and Renaissance	1-2
ARC 0731 1223	DT II: Theories and Methods in Architectural Design	1-2
ARC 0731 2121	Art and Architecture III: Modern and Contemporary Architecture	2-1
ARC 0731 2221	Art and Architecture IV: South Asian Architecture	2-2
ARC 0731 2222	Field Work I: Contemporary Architecture	2-2
ARC 0731 4121	Art and Architecture V: Society and Architecture of Bengal	4-1
ARC 0222 4122	Field Work II: Architecture of Bengal	4-1
ARC 0222 4123	Heritage studies and Conservation	4-1
ARC 0222 5122	Documentation of Built Heritage	5-1
Stream 3	**Design Studio**	**64 credits**
ARC 0731 1132	Design Studio I	1-1
ARC 0731 1232	Design Studio II	1-2
ARC 0731 2132	Design Studio III	2-1
ARC 0731 2232	Design Studio IV	2-2
ARC 0731 3132	Design Studio V	3-1
ARC 0731 3232	Design Studio VI	3-2
ARC 0731 4132	Design Studio VII	4-1
ARC 0731 4232	Design Studio VIII	4-2
ARC 0731 5132	Design Studio IX	5-1
ARC 0731 5232	Thesis II: Design Studio X	5-2
Stream 4	**Environmental Design**	**8 credits**
ARC 0712 1241	ED I: Climate and Design	1-2
ARC 0712 2141	ED II: Design in the Tropics	2-1
ARC 0521 2143	Ecology and Environment	2-1
ARC 0712 2241	ED III: Visual and Sonic Environment	2-2
ARC 0712 5142	Environmental Simulation Lab	5-1

Stream 5	Architectural Representation	13 credits
ARC 0732 1152	Architectural Graphics I: Basic Drawing	1-1
ARC 0732 1252	Architectural Graphics II: Advanced drawing	1-2
ARC 0211 2152	Computer Aided Design	2-1
ARC 0213 2154	Architectural Sketching and Modelling	2-1
ARC 0211 2156	Photography and Media studies	2-1
ARC 0211 2151	Graphic Art and Design	2-2
ARC 0732 3152	Working drawing	3-1

Stream 6	Architectural Technology	11 credits
ARC 0732 2261	Construction Materials and Methods	2-2
ARC 0732 3262	Field Work III: Building Construction	3-2
ARC 0732 3263	Building Services III- Plumbing	3-2
ARC 0732 3264	Building Information Modelling	3-2
ARC 0532 4162	Computer Aided Spatial Analysis	4-1
ARC 0732 4261	Building Maintenance and Retrofitting	4-2
ARC 0732 5162	Cost Estimation and Specification	5-1

Stream 7	Design for the Built Environment	16 credits
ARC 0213 2271	Philosophy	2-2
ARC 0731 3171	Facilities Planning and Design	3-1
ARC 0212 3271	Interior Design	3-2
ARC 0313 3273	Behavior Studies in Architecture	3-2
ARC 0731 4171	Landscape Design	4-1
ARC 0212 4172	Interior Design Studio	4-1
ARC 0712 4173	Architecture for Sustainability	4-1
ARC 0731 4271	Vernacular Architecture and Settlements	4-2
ARC 0731 4272	Landscape Design Studio	4-2
ARC 0731 4274	Collaborative Design Studio	4-2

Stream 8	Planning and Management for the Built Environment	12 credits
ARC 0731 3181	Introduction to Spatial Planning	3-1
ARC 0731 3281	Urban Design	3-2
ARC 0731 4181	Housing	4-1
ARC 0731 4183	Rural Studies of Bangladesh	4-1
ARC 0731 4281	Community Architecture and Planning	4-2
ARC 0731 4283	Planning and Management for Disaster Resilience	4-2

Stream 9	Architectural Research and Practice	16 credits
ARC 0731 4291	Architectural Research Methodology	4-2
ARC 0731 5194	Professional Practice I: Internship	5-1
ARC 0731 5192	Thesis I: Research Development	5-1

ARC 0731 5196	Architecture in Dialogue: Seminar	5-1
ARC 0731 5291	Professional Practice II: Codes and Ethics	5-2
ARC 0731 5292	Thesis III: Dissertation	5-2

Category of Courses

Course Category	Code	Title	Type	Credit
GED	ENG 0231 1111A	English Language	Theory	1
GED	ENG 0231 1112A	English Language (Lab)	Sessional	2
GED	MAT 0541 1113A	Mathematics	Theory	2
GED	PHY 0533 1211A	Physics for Architects	Theory	2
GED	SSS 0222 1213A	History of the Emergence of Independent Bangladesh	Theory	3
GED	ECO 0311 2215A	Principles of Economics	Theory	2
GED	CSE 0613 2113A	Introduction to Programming With Python	Theory	2
GED	CSE 0613 2214A	Introduction to Programming With Python	Sessional	2
GED	SOC 0314 2213A	Principles of Sociology	Theory	2
GED	ANP 0314 3115A	Culture, Space and Place	Theory	2
GED	STA 0542 3117A	Statistics for Architects	Theory	2
GED	CEE 0732 2111A	Structure I - Basic Mechanics	Theory	2
GED	CEE 0732 2211A	Structure II - Mechanics of Solids	Theory	2
GED	CEE 0732 3111A	Structure III – Building Structures I	Theory	2
GED	CEE 0732 4211A	Construction Management	Theory	2
GED	MEE 0715 3113A	Building Services I- Mechanical	Theory	2
GED	CEE 0732 3211A	Structure IV – Building Structures II	Theory	2
GED	EEE 0713 3213A	Building Services II - Electrical	Theory	2
Core	ARC 0731 1121	Art and Architecture I: Ancient civilizations	Theory	2
Core	ARC 0213 1123	DT I: Aesthetics and Art Appreciation	Theory	2

Core	ARC 0521 2143	Ecology and Environment	Theory	2
Core	ARC 0731 1132	Design Studio I	Sessional	6
Core	ARC 0732 1152	Architectural Graphics I: Basic Drawing	Sessional	3
Core	ARC 0731 1221	Art and Architecture II: Medieval Europe and Renaissance	Theory	2
Core	ARC 0731 1223	DT II: Theories and Methods in Architectural Design	Theory	2
Core	ARC 0731 1232	Design Studio II	Sessional	6
Core	ARC 0712 1241	ED I: Climate and Design	Theory	2
Core	ARC 0732 1252	Architectural Graphics II: Advanced drawing	Sessional	3
Core	ARC 0731 2121	Art and Architecture III: Modern and Contemporary Architecture	Theory	2
Core	ARC 0731 2132	Design Studio III	Sessional	6
Core	ARC 0712 2141	ED II: Design in the Tropics	Theory	2
Core	ARC 0211 2152	Computer-Aided Design		2
Core	ARC 0731 2221	Art and Architecture IV: South Asian Architecture	Theory	2
Core	ARC 0731 2222	Field Work I: Contemporary Architecture	Field work	1
Core	ARC 0731 2232	Design Studio IV	Sessional	6
Core	ARC 0712 2241	ED III: Visual and Sonic Environment	Theory	2
Core	ARC 0732 2261	Construction Materials and Methods	Theory	2
Core	ARC 0731 4121	Art and Architecture V: Society and Architecture of Bengal	Theory	2
Core	ARC 0731 3132	Design Studio V	Sessional	6
Core	ARC 0732 3152	Working drawing	Sessional	2
Core	ARC 0731 3181	Introduction to Spatial Planning	Theory	2
Core	ARC 0222 4122	Field Work II: Architecture of Bengal	Field work	2
Core	ARC 0731 3232	Design Studio VI	Sessional	6
Core	ARC 0732 3262	Field Work III: Building Construction	Field work	1
Core	ARC 0731 4271	Vernacular Architecture and Settlements	Theory	2
Core	ARC 0731 3281	Urban Design	Theory	2

Core	ARC 0212 3271	Interior Design	Theory	2
Core	ARC 0731 4132	Design Studio VII	Sessional	6
Core	ARC 0212 4172	Interior Design Studio	Sessional	2
Core	ARC 0731 4181	Housing	Theory	2
Core	ARC 0731 4171	Landscape Design	Theory	2
Core	ARC 0731 4232	Design Studio VIII	Sessional	6
Core	ARC 0731 4272	Landscape Design Studio	Sessional	2
Core	ARC 0731 4291	Architectural Research Methodology	Theory	2
Core	ARC 0731 5132	Design Studio IX	Sessional	6
Core	ARC 0731 5192	Thesis I: Research Development	Sessional	2
Core	ARC 0731 5291	Professional Practice II: Codes and Ethics	Theory	2
Capstone	ARC 0731 5232	Thesis II: Design Studio X	Sessional	10
Capstone	ARC 0731 5292	Thesis III-Dissertation	Sessional	4
Internship	ARC 0731 5194	Professional Practice I: Internship	Internship	4
Elective	ARC 0211 2151	Graphic Art and Design	Sessional	2
Elective	ARC 0213 2154	Architectural Sketching and Modelling	Sessional	2
Elective	ARC 0211 2156	Photography and Media Studies	Sessional	2
Elective	ARC 0213 2271	Philosophy	Theory	2
Elective	ARC 0731 3171	Facilities Planning and Design	Theory	2
Elective	ARC 0732 3263	Building Services III- Plumbing	Theory	2
Elective	ARC 0732 3264	Building Information Modelling	Sessional	2
Elective	ARC 0313 3273	Behavior Studies in Architecture	Theory	2
Elective	ARC 0532 4162	Computer-Aided Spatial Analysis	Sessional	2
Elective	ARC 0712 4173	Architecture for Sustainability	Theory	2
Elective	ARC 0731	Rural Studies of Bangladesh	Theory	2

	4183			
Elective	ARC 0731 4274	Collaborative Design Studio	Sessional	2
Elective	ARC 0222 4123	Heritage Studies and Conservation	Theory	2
Elective	ARC 0732 4261	Building Maintenance and Retrofitting	Theory	2
Elective	ARC 0731 4281	Community Architecture and Planning	Theory	2
Elective	ARC 0731 4283	Planning and Management for Disaster Resilience	Theory	2
Elective	ARC 0731 5196	Architecture in Dialogue: Seminar	Sessional	2
Elective	ARC 0732 5162	Cost Estimation and Specification	Sessional	2
Elective	ARC 0712 5142	Environmental Simulation Lab	Sessional	2
Elective	ARC 0222 5122	Documentation of Built Heritage	Sessional	2

Core course requirements for B. Arch. Degree

First Year: 1st Semester

Course No.	Course Title	Course Category	Hours/Week			Pre-requisite
			Theory	Lab	Credits	
	Compulsory course					
ARC 0731 1121	Art and Architecture I: Ancient civilizations	Core	2	0	2	-
ARC 0213 1123	DT I: Aesthetics and Art Appreciation	Core	2	0	2	-
ARC 0731 1132	Design Studio I	Core	0	12	6	-
ARC 0732 1152	Architectural Graphics I: Basic Drawing	Core	0	6	3	-
ENG 0231 1111A	English Language	General Education	2	0	2	-
ENG 0231 1112A	English Language (Lab)	General Education	0	2	1	-
MAT 0541 1113A	Mathematics	General Education	2	0	2	-
Total			8	20	**18**	

First Year: 2nd Semester

Course No.	Course Title	Course Category	Hours/Week			Pre-requisite
			Theory	Lab	Credits	
	Compulsory course					
ARC 0731 1221	Art and Architecture II: Medieval Europe and Renaissance	Core	2	0	2	-
ARC 0731 1223	DT II: Theories and Methods in Architectural Design	Core	2	0	2	-
ARC 0731 1232	Design Studio II	Core	0	12	6	ARC 0731 1132 ARC 0732 1152
ARC 0712 1241	ED I: Climate and Design	Core	2	0	2	-
ARC 0732 1252	Architectural Graphics II: Advanced drawing	Core	0	6	3	ARC 0731 1132 ARC 0732 1152
PHY 0533 1211A	Physics for Architects	General Education	2	0	2	-
SSS 0222 1213A	History of the Emergence of Independent Bangladesh	General Education	3	0	3	-
Total			11	18	**20**	

Second Year: 1st Semester

* Required credits of optional courses from **Set A** is **4.0** (**2 courses**), which should be completed by **2nd year**

Course No.	Course Title	Course Category	Hours/Week			Pre-requisite
			Theory	Lab	Credits	
	Compulsory course					
ARC 0731 2121	Art and Architecture III: Modern and Contemporary Architecture	Core	2	0	2	-
ARC 0712 2141	ED II: Design in the Tropics	Core	2	0	2	-
ARC 0521 2143	Ecology and Environment	Core	2	0	2	-
ARC 0731 2132	Design Studio III	Core	0	12	6	ARC 0731 1232 ARC 0732 1252
ARC 0211 2152	Computer-Aided Design	Core	0	4	2	-
CEE 0732 2111A	Structure I - Basic Mechanics	General Education	2	0	2	-
Total			8	16	**16**	

Second Year: 2nd Semester

* Required credits of optional courses from **Set A** is **4.0** (**2 courses**), which should be completed by **2nd year**

Course No.	Course Title	Course Category	Hours/Week			Pre-requisite
			Theory	Lab	Credits	
	Compulsory course					
ARC 0731 2221	Art and Architecture IV: South Asian Architecture	Core	2	0	2	-
ARC 0731 2222	Field Work I: Contemporary Architecture	Core	0	1w	2	-
ARC 0731 2232	Design Studio IV	Core	0	12	6	ARC 0731 2132
ARC 0712 2241	ED III: Visual and Sonic Environment	Core	2	0	2	-
ARC 0732 2261	Construction Materials and Methods	Core	2	0	2	-
CEE0732 2211A	Structure II - Mechanics of Solids	General Education	2	0	2	-
ECO 0311 2215A	Principles of Economics	General Education	2	0	2	-
Total			10	12	**18**	

Third Year: 1st Semester

* Required credits of optional courses from **Set B** is **4.0** (**2 courses**), which should be completed by **3rd year**

Course No.	Course Title	Course Category	Hours/Week			Pre-requisite
			Theory	Lab	Credits	
	Compulsory course					
ARC 0731 3181	Introduction to Spatial Planning	Core	2	0	2	-
ARC 0731 3132	Design Studio V	Core	0	12	6	ARC 0731 2232
ARC 0732 3152	Working drawing	Core	0	4	2	-
CEE 0732 3111A	Structure III – Building Structures I	General Education	2	0	2	-
MEE0715 3113A	Building Services I-Mechanical	General Education	2	0	2	-
Total			6	16	**14**	

Third Year: 2nd Semester

* Required credits of optional courses from **Set B** is **4.0** (**2 courses**), which should be completed by **3rd year**

Course No.	Course Title	Course Category	Hours/Week			Pre-requisite
			Theory	Lab	Credits	
	Compulsory course					
ARC 0212 3271	Interior Design	Core	2	0	2	-
ARC 0731 3281	Urban Design	Core	2	0	2	-
ARC 0731 3232	Design Studio VI	Core	0	12	6	ARC 0731 3132
CEE 0732 3211A	Structure IV – Building Structures II	General Education	2	0	2	-
EEE0713 3213A	Building Services II - Electrical	General Education	2	0	2	-
Total			8	12	**14**	

Fourth Year: 1st Semester

* Required credits of optional courses from **Set B** is **4.0** (**2 courses**), which should be completed by **4th year**

Course No.	Course Title	Course Category	Hours/Week			Pre-requisite
			Theory	Lab	Credits	
	Compulsory course					
ARC 0731 4121	Art and Architecture V: Society and Architecture of Bengal	Core	2	0	2	-
ARC 0731 4132	Design Studio VII	Core	0	12	6	ARC 0731 3232
ARC 0731 4171	Landscape Design	Core	2	0	2	-
ARC 0212 4172	Interior Design Studio	Core	0	4	2	-
ARC 0731 4181	Housing	Core	2	0	2	-
ARC 0222 4122	Field Work II: Architecture of Bengal	Core	0	1w	2	-
Total			6	16	**16**	

Fourth Year: 2nd Semester

* Required credits of optional courses from **Set C** is **4.0** (**2 courses**), which should be completed by **4th year**

Course No.	Course Title	Course Category	Hours/Week			Pre-requisite
			Theory	Lab	Credits	
	Compulsory course					
ARC 0731 4232	Design Studio VIII	Core	0	12	6	ARC 0731 4132
ARC 0731 4271	Vernacular Architecture and Settlements	Core	2	0	2	-
ARC 0731 4272	Landscape Design Studio	Core	0	4	2	-
ARC 0731 4291	Architectural Research Methodology	Core	2	0	2	-
CEE0732 4211A	Construction Management	General Education	2	0	2	-
Total			6	16	**14**	

Fifth Year: 1st Semester

* Required credits of optional courses from **Set D** is **4.0** (**2 courses**), which should be completed by this semester and student can register maximum 3 courses from Set D

Course No.	Course Title	Course Category	Hours/Week			Pre-requisite
			Theory	Lab	Credits	
	Compulsory course					
ARC 0731 5132	Design Studio IX	Core	0	12	6	ARC0731 4232
ARC 0731 5192	Thesis I: Research Development	Core	0	4	2	ARC0731 4232
ARC 0731 5194	Professional Practice I: Internship	Internship	-	12w	4	-
Total			0	16	**12**	

Fifth Year: 2nd Semester

Course No.	Course Title	Course Category	Hours/Week			Pre-requisite
			Theory	Lab	Credits	
	Compulsory course					
ARC 0731 5232	Thesis II: Design Studio X	Capstone	0	20	10	ARC 0731 5132 ARC0731 5192
ARC 0731 5291	Professional Practice II: Codes and Ethics	Core	2	0	2	-
ARC 0731 5292	Thesis III- Dissertation	Capstone	0	8	4	ARC 0731 5132 ARC 0731 5192
Total			2	28	**16**	

Optional course requirements for B. Arch. Degree:

Year/Session	Required optional courses/credits (Per Year)		Maximum allowable optional courses/credits from regular courses per Semester (Excluding drop courses)	
	Course	**Credit**	**Course**	**Credit**
2nd Year 1st Semester	2 (Set A)	4.0	2	4.0
2nd Year 2nd Semester			2	4.0
3rd Year 1st Semester	2 (Set B)	4.0	2	4.0
3rd Year 2nd Semester			2	4.0
4th Year 1st Semester	2 (Set C)	4.0	2	4.0
4st Year 2nd Semester			2	4.0
5th Year 1st Semester	2 (Set D)	4.0	3	6.0
Total	**8**	**16.0**	**15**	**30.0**

Optional Courses

Set A **2nd year optional Cources**

* Required credits of optional courses from **Set A** is **4.0** (**2 courses**) and student can register maximum 2 courses from each semester

Course No.	Course Title	Course Category	Theory credit	Lab Credit	Hour /week
ARC 0213 2154	Architectural Sketching and Modelling	Elective	0	2	4
ARC 0211 2156	Photography and Media Studies	Elective	0	2	4
ARC 0211 2151	Graphic Art and Design	Elective	0	2	4
CSE 0613 2113A	Introduction to Programming With Python (Theory)	General Education	2	0	2
ARC 0213 2271	Philosophy	Elective	2	0	2
CSE 0613 2214A	Introduction to Programming With Python (Lab)	General Education	0	2	4
SOC 0314 2213A	Principles of Sociology	General Education	2	0	2
			06	**08**	

Set B **3rd year Optional Cources**

* Required credits of optional courses from **Set B** is **4.0** (**2 courses**) and student can register maximum 2 courses from each semester

Course No.	Course Title	Course Category	Theory credit	Lab Credit	Hour /week
ARC 0731 3171	Facilities Planning and Design	Elective	2	0	2
ANP 0314 3115A	Culture, Space and Place	General Education	2	0	2
STA 0542 3117A	Statistics for Architects	General Education	2	0	2
ARC 0313 3273	Behavior Studies in Architecture	Elective	2	0	2
ARC 0732 3264	Building Information Modelling	Elective	0	2	4
ARC 0732 3262	Field Work III: Building Construction	Elective	0	1w	1
ARC 0732 3263	Building Services III-Plumbing	Elective	2	0	2
			10	**03**	

Set C **4th Year Optional Courses**

* Required credits of optional courses from **Set C** is **8.0** (**4 courses**) and student can register maximum 2 courses from each semester

Course No.	Course Title	Course Category	Theory credit	Lab Credit	Hour /week
ARC 0532 4162	Computer-Aided Spatial Analysis	Elective	0	2	4
ARC 0222 4123	Heritage Studies and Conservation	Elective	2	0	2
ARC 0712 4173	Architecture for Sustainability	Elective	2	0	2
ARC 0731 4183	Rural Studies of Bangladesh	Elective	2	0	2
ARC 0731 4274	Collaborative Design Studio	Elective	0	2	4
ARC 0732 4261	Building Maintenance and Retrofitting	Elective	2	0	2
ARC 0731 4281	Community Architecture and Planning	Elective	2	0	2
ARC 0731 4283	Planning and Management for Disaster Resilience	Elective	2	0	2
			12	**04**	

Set D	5th Year 1st Semester Optional Courses * Required credits of optional courses from **Set D** is **4.0** (**2 courses**) and student can register maximum 3 courses from this semester				
Course No.	Course Title	Course Category	Theory credit	Lab Credit	Hour /week
ARC 0731 5196	Architecture in Dialogue: Seminar	Elective	0	2	4
ARC 0732 5162	Cost Estimation and Specification	Elective	0	2	4
ARC 0712 5142	Environmental Simulation Lab	Elective	0	2	4
ARC 0222 5122	Documentation of Built Heritage	Elective	0	2	4
				08	

Requirements for receiving B. Arch. Degree

1. Credit requirement for B. Arch. degree at SUST is **174.0**
2. Students need to complete **158.0** credits compulsory courses with **16.0** credits optional courses.
3. For each semester (2nd year to 5th year), students can register for maximum **4.0** credits (2 courses) as optional course.
4. Required credits of optional courses from each set must be completed.
5. Optional courses will be offered at the beginning of each semester (2nd year to 5th year).

PART C

OBE Curriculum of
Department of Architecture
Shahjalal University of Science and Technology, Sylhet, Bangladesh

Year/ Semester	**1st Year 1st Semester**		
Course Title	**Art and Architecture I: Ancient Civilizations**		
Course Code	ARC 0731 1121	**Module**	2
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

This course intends to develop skills for cultural interpretation of built environment through survey and analysis of historic structures, which is an inherent part of architecture education.

COURSE OBJECTIVES

- To facilitate basic knowledge about the evolutionary process of early human society and architecture.
- To provide the knowledge of different political regimes and religious philosophy that influence development ancient civilizations.
- Acquaint students with the major drivers behind shaping any civilization and their influence of art and architecture development.
- Helping the students to develop skill towards art & architecture appreciation where students could identify architectural styles with relevance to age, time and location.

COURSE CONTENT

Overview of the perceptual process of evolution in the Art and Architecture of ancient civilizations. Critical evaluation of ancient architecture and settlement design of major four river valley civilizations: the Nile River valley (Ancient Egypt), the Tigris/Euphrates River valley (Ancient Mesopotamia), the Indus River valley (Ancient India) and the Huang He River valley (Ancient China).

Introduction to classical architecture of Greece and Rome; Critical evaluation of the classical Architecture of Greece and Rome from political, social and philosophical point of view. Aegean and the Etruscan influence on development of Greek and Roman architecture.

	After successful completion of the course, students will be able to:
CO 1	recognize the principal buildings of the various ancient civilizations
CO 2	identify the factors that influence the architectural traditions of each of the ancient civilizations through construction technique, material culture
CO 3	compare the architecture of the various civilizations in terms of design idea, social belief, religious philosophy
CO 4	develop an awareness of the inherent connections of the built environment to the natural environment, and the subsequent implications for cultural and environmental sustainability
CO 5	apply the language of architectural form, space and order in the design studio

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3		2						
CO 2						2		2	
CO 3		3				3			
CO 4		2				3			
CO 5		2				3			

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-Learning Strategy	**Assessment strategy**
CO1	Lecture with projector	Semester-End examination
CO2	Self-learning	Oral presentation, Semester-End examination
CO3	Class discussion/seminar/tutorial	Assignment(s), Semester-End examination
CO4	Lecture	Mid-semester examination, Semester-End examination
CO5	Self-learning	Semester-End examination

Books Recommended

1. **Fletcher B.:** A History of Architecture, Architectural Press; 20th edition (21 Sep 1996)
2. **Fazio M. A:** World History of Architecture, Publisher: McGraw-Hill Professional;2nd Rev ed.
3. **Cole E.:** The Grammar of Architecture, Bulfinch
4. **Harvey, J. H.:** The Gothic World 1100-1600, London, 1950
5. **Francis D. K. Ching**: A Visual Dictionary of Architecture
6. **Murray, P.:** Architecture of the Renaissance, New York, 1971
7. **Million, Henry, A. (ed**): The Triumph of the Baroque Architecture in Europe 1600-1750, London, 1999
8. **Minor, V. H.:** Baroque and Rococo Art and Culture, London

Year/ Semester	1st Year 1st Semester		
Course Title	**DT I: Aesthetics and Art Appreciation**		
Course Code	ARC 0213 1123	**Module**	2
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

Art Appreciation presents with an elementary but thorough introduction to the world of artas a whole. Starting from the prehistoric artists and artisans, the course will progressively guide the learners through the ever-changing timescapes in arthistory, up to its contemporary trends and practices. The course will also combine the issues of method and technique with that of human perception and creativity in an attempt to know art as a communicative language, and more. Additionally, the basic technicalities and fundamentals of visual criticism are to be explored in this discourse.

COURSE CONTENT:

Aesthetics: Introduction to the subject matter and purpose of aesthetics; Aesthetics in the realm of art and design, its relation to the common people. Aesthetics and the act of creation, Aesthetic knowledge as a system; Methods of aesthetics; Aesthetic activity, Essence and principal forms of aesthetics, Theoretical models of Aesthetics; Aesthetics as meta category: the Mood, Rasa and the Style; Psychology of perception and creation; Developments of ideas and their trends in the field of aesthetic activity, the concept and the architectural concept, theory of criticism.

Art Appreciation: Criticism and Appreciation. Definition of art; Relationship between art & science; Art as social phenomenon; Function of art; The method of art; Branches of art; Evolution of different art forms; Introduction to concept, perception and development of art in different context. Characteristics of various forms of art, meaning of art, art as experience and expression, the language of visual art, typology of visual art, analysis of the work of art; theory of criticism.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	connect over various philosophical standpoints with global Art and Architecture
CO 2	initiate the process of visual thinking (instead of verbal thinking)
CO 3	work on the ability of identifying positive visual qualities, and also to learn the languages of criticism
CO 4	relate the media(s) and the method(s) to technical/technological advancement
CO 5	interpret the basic languages of Architecture

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2						3		
CO 2							3		
CO 3		2	2				3		
CO 4							3	2	
CO 5		2					2		3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-Learning Strategy	**Assessment strategy**
CO1	Lecture	Semester-End examination
CO2	Self-learning	Oral presentation, Semester-End examination
CO3	Field survey/demonstration	Assignment(s), Semester-End examination
CO4	Lecture	Mid-semester examination, Semester-End examination
CO5	Self-learning	Semester-End examination

Books Recommended

1. **Faulkner, R., Ziegfeld, E., and Smagula, H**.: Art Today.
2. **Lyas, Colin (2003);** Aesthetics; Routledge; London.
3. **Nelson, R.S. and Shiff, R**.: Critical Terms for Art History
4. **Read, H**.: The Meaning of Art.
5. **Yuri Borev**: Aesthetics (Sociological Aspect)
6. **Colin Lies**: Aesthetics (Philosophical Aspect)
7. **Herbert Read**: The Art of Sculpture (Sculpture)
8. **Ashok Mitra**: *Paschim Europer Chitrakala, Chhobi kake bole, Europe er vashkarjo*.
9. **Moin Choudhury**: *Shristir Siri*.
10. **Dhiman Das Gupta**: Composition, *Cinemar image*.
11. **Fleming, William** (1994); Arts and Ideas; Wadsworth Publishing; Boston
12. **Satyajit Roy**: *Bishoy Chalachitra*.
13. **Sunil Gangopadhyay**: *Chhobir deshe kobitar deshe, Onnodesher kobita*

Year/ Semester	1st Year 1st Semester		
Course Title	**Design Studio I**		
Course Code	ARC 0731 1132	**Module**	3
No. of Credits	6	**Course Hour**	12 hours/week

COURSE RATIONALE:

This is a foundation course for design. This course intends to develop fundamental skills for visual design to give a basis for architecture design education.

COURSE CONTENT:

Study of human senses and their relation to design; Introduction to visual composition through Elements of Design: Properties, qualities and characteristics of point, line, shape, form, color and texture, Understanding of forms in nature.

Study of material for design, Understanding the Principles of Design: Scale, Proportion, Balance, Harmony, Rhythm, Order and Contrast, Introducing the concept of Space in visual composition**.**

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Distinguish between point, line and shape as an aesthetic and visual design element
CO 2	interpret basic design idea and concepts verbally
CO 3	Generate creative idea in a methodological process and interpret it in design projects
CO 4	Critically evaluate self-works and other basic compositions based on composition principles
CO 5	Apply fundamental design principles (primary elements, composition of form and space, proportion and scale, ordering principles) in two-dimensional composition

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs:

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3							
CO 2	2						2		3
CO 3	2	3					2		
CO 4	2	2					3		
CO 5	2	3							2

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO 1	Project based learning	Continuous assessment, Summative Assessment
CO 2	Project based learning	Oral Presentation , Summative Assessment
CO 3	Project based learning	Continuous assessment, Summative Assessment
CO 4	Self-learning	Oral Presentation , Summative Assessment
CO 5	Project based learning	Continuous assessment, Summative Assessment

Books Recommended

1. Pramar V.S., Design fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Nelhi, 1973.
2. Francis D.K.Ching, "Architecture: Form, Space and Order, Van Nostrand Reinhold Co., (Canaa),1979.
3. Elda Fezei, Henny Moore, Hamlyn, London, New York, Sydney, Toronto, 1972.
4. Lawrence Bunchy C.: Acrylic for Sculpture and Design, 450, West 33rd Street, New York, N.Y.10001, 1972.
5. Exner V., Pressel D., "Basics Spatial Design", Birkhanser, 2009.
6. Snyder, James: Introduction to Architecture
7. Scot Foresman: Art.
8. Owen Cappleman & Michael Jack Jordon, Foundations in Architecture: An Amotated Anthology of Beginning Design Project, Van Nostrand Reinhold New York, 1993.
9. Charles Wallschlacgerm & Cynthia Busic-Snyder, Basic Visual Concepts and Principles for Artists, Architects and Designers, McGraw Hill, New York 1992

Year/ Semester	**1st Year 1st Semester**		
Course Title	**Architectural Graphics I: Basic Drawing**		
Course Code	ARC 0732 1152	**Module**	5
No. of Credits	3.0	**Course Hour**	6.0 hours/week

COURSE RATIONALE:

This course intends to inculcate the fundamental graphical language and principles to represent architectural drawings in the students.

COURSE CONTENT:

Line drawing quality; Study of scale; Lettering; Execution of plan, elevation and section; Execution of oblique, isometric and diametric drawings; Introduction to mechanical perspective.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Draw 2-dimensional architectural presentation drawings.
CO 2	Translate different graphical language and symbols.
CO 3	Utilize different architectural scales accordingly
CO 4	Use proper techniques and instruments for hand-drawn graphics
CO 5	Execute architectural drawing of a simple building

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3								3
CO 2	3								3
CO 3	3								2
CO 4	2							3	
CO 5	3								3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Project, lecture	Continuous assessment, Summative Assessment
CO2	Project, lecture	Continuous assessment, Summative Assessment
CO3	Project, lecture	Continuous assessment, Summative Assessment
CO4	Project, lecture	Continuous assessment, Summative Assessment
CO5	Project, lecture	Continuous assessment, Summative Assessment

Books Recommended

1. Ching, F.D.K.: Architectural Graphics.
2. Gill, R.W.: Rendering with Pen & Ink.

Year/ Semester	**1st Year 1st Semester**
Course Title	**English Language**

Course Code	ENG 0231 1111A	**Stream**	1
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

This course is expected to develop two basic skills i.e. reading and writing. A variety of reading strategies and texts will be used to effectively develop first year students'
academic reading skills thereby facilitating their future study. Also, the course focuses on developing the writing skills of students by familiarizing them with grammar rules, providing them with practice and enabling them to demonstrate the accurate use of grammar in their writing.

COURSE OBJECTIVES

- To enable students to write with accuracy.
- To facilitate effective and comprehensible writing.
- To raise awareness of common errors that occur in writing.
- To develop student's ability to understand write-ups on issues of general concern.
- To improve the vocabulary of learners for effective communication.

COURSE CONTENT

a) Reading

Different Reading Strategies
Guessing Meaning from the Context
Critical Reading (Analyze)
Critical Reading (Synthesize)
Critical Reading (Evaluate)
Annotation
Summary Writing

Material

A selection of 08-10 editorials and reports from newspapers/magazines/journals, etc.
Reading texts in New Headway Upper Intermediate Student's Book (Current edition)
Selected passages from recommended books
A selection of other material may be supplied as handouts as deemed necessary by the instructor

b) Writing

Forms and functions of different word categories (Noun, verb, adjective, etc.)
Aspects and uses of tense
Subject-verb agreement
Use of infinitive, gerund, present participle, past participle, modals, causatives, conditionals, subjunctives, modals.
Use of sentence connectors/ cohesion markers/ punctuation
Effective combination of sentences (simple, complex, compound)
Developing a paragraph

COURSE LEARNING OUTCOMES:

After successful completion of the course, students will be able to:	
CO 1	apply grammar rules
CO 2	produce grammatically correct meaningful sentences
CO 3	express oneself correctly by using appropriate words, phrases, sentences or ideas
CO 4	critically reflect on a text (grasp abstract ideas and interpret them effectively, arrive at well-reasoned conclusions and solutions)
CO 5	extract information from passages accurately

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1							2		3
CO 2									3
CO 3									3
CO 4							3		3
CO 5						2	2		3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	Midterm Examination, Semester-end examination
CO2	Self-learning using reference	Semester-end examination
CO3	Lecture	Midterm Examination, Semester-end examination
CO4	Self-learning using reference	Quiz, Semester-end examination
CO5	Student-led classroom - Teamwork in peer groups.	Assignment, Semester-end examination

Books Recommended

1. **Tibbits, E. E. ed**. Exercises in Reading Comprehension. Longman
2. **Liz and John Soars.** (Current edition). New Headway Upper Intermediate Student's Book
3. **Oxford**: Oxford University Press
4. Cliff's TOEFL
5. Other Resources recommended by course instructors

Year/ Semester	**1st Year 1st Semester**		
Course Title	**English Language (Lab)**		
Course Code	ENG 0231 1112A	**Stream**	1
No. of Credits	1.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

This course is designed to improve the speaking and listening skills of students in the English language. Emphasis is laid on proper pronunciation for accurate articulation and recognition of speech sounds as well as correct stress, intonation and language use in varied situations.

COURSE OBJECTIVES

- To enable students' understanding of the variations in pronunciation.
- To teach proper pronunciation and accurate articulation.
- To facilitate appropriate stress and intonation in speech.
- To encourage use of English effectively in everyday situations.
- To ensure overall improvement of oral communication through listening and speaking.

COURSE CONTENT

(a) Speaking

Articulators
English Phonetic Alphabet (British and American) and International Phonetic Alphabet (IPA)
Stress rules of English
Intonation rules and functions of intonation
Communication Styles and Cultural Context
Fluency, mistakes, misunderstandings, audience, taboos, self-esteem, confidence
Activities: dialogue, debate, extempore speech, interview, role-play

(b) Listening

Basics of listening
Various types of Pronunciation
IPA, RP, Transcription
Different accents and intonation patterns
Activities for Meaning-focused Listening, Information Transfer Strategies,
Listening Practice through selection of audio clips.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Identify the symbols of the International Phonetic Alphabet used to represent the sounds of the English language.
CO 2	Distinguish between varied accents in English
CO 3	interpret information accurately
CO 4	apply appropriate intonation and stress patterns in English words and sentences
CO 5	produce continuous speech clearly and convincingly

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1							3		2
CO 2									3
CO 3							2		3
CO 4							2		3
CO 5					3				3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	Midterm Examination, Semester-end examination
CO2	Self-learning using reference	Semester-end examination
CO3	Lecture	Midterm Examination, Semester-end examination
CO4	Self-learning using reference	Quiz, Semester-end examination
CO5	Class discussion/seminar/tutorial	Assignment, Semester-end examination

Books Recommended

1. **Anderson, A. & Lynch, T**. Listening. Oxford: Oxford University Press, 1988
2. **Hancock, Mark**. English Pronunciation in Use. New York: Cambridge University Press, 2004
3. **Anderson, Kenneth, et al**. Study Speaking. Cambridge University Press, 2007
4. **Hancock, Mark**. English Pronunciation in Use. Cambridge University Press, 2004
5. **Jones, Daniel**. Cambridge English Pronunciation Dictionary. Cambridge University Press, 2011
6. **Richards J, et al**. Person to Person. Oxford University Press, 2007
7. **Richards, Jack C, and David Bohlke**. Speak Now: 1. Oxford University Press, 2013
8. **Roach, Peter**. English Phonetics and Phonology. Cambridge University Press, 2009

Year/ Semester	**1st Year 1st Semester**		
Course Title	**Mathematics**		
Course Code	MAT 0541 1113A	**Stream**	1
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

This course intends to teach architecture students with fundamental knowledge of mathematical problem solving to prepare them for upper-level courses.

COURSE OBJECTIVES

- To give students fundamental knowledge of mathematical problem-solving skill.
- To teach importance and relevance of mathematics for architectural education and knowledge.
- To ensure a multidisciplinary approach for architecture education

COURSE CONTENT

Differential Calculus: Function; limit; continuity; differentiation; successive and partial differentiation; Rolle's theorem; mean value theorem; maxima and minima. Integral Calculus: Integration by various methods; standard integrals; definite

integrals; length of curves; area bounded by plane curves; volumes and surface areas of solids of revolution.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	explain derivatives and applications
CO 2	solve exponential and logarithmic functions
CO 3	define integrals and its applications
CO 4	Relate the architectural design with mathematical basics.

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2								
CO 2		2							
CO 3	2								
CO 4	3	2					2	2	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	Midterm Examination, Semester-end examination
CO2	Self-learning using reference	Assignment, Semester-end examination
CO3	Lecture	Midterm Examination, Semester-end examination
CO4	Self-learning using reference	Quiz, Semester-end examination

Books Recommended

1. **Thomas and Finney**: Calculus and Analytic Geometry
2. **E. W Swokowski:** Calculus with Analytic Geometry
3. **H. Anton**: Calculus
4. **Rahman and Bhattacharjee**: Co-ordinate geometry of two and three dimensions
5. **Loney, S. L.:** Coordinate Geometry of Two dimensions
6. **Smith, C.:** The Analytical Geometry of Conic Section

Year/ Semester	**1st Year 2nd Semester**		
Course Title	**Art and Architecture II: Medieval Europe and Renaissance**		
Course Code	ARC 0731 1221	**Stream**	2
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

This course intends to develop skills for cultural interpretation of built environment through survey and analysis of historic structures, which is an inherent part of architecture education.

COURSE CONTENT:

A critical evaluation of the architecture of Western civilization. Its roots in Etruscan and Roman architecture which developed through the ages of Early Christian, Byzantine and Romanesque periods resulting in the Gothic style. Moorish architecture in Spain. Climatic, geographical, religious and social influences on the architecture in these periods. Structural innovations and construction systems adopted in different periods.

Revival of classical thoughts in the Renaissance period and contribution of architects. Evolution of Renaissance philosophy through phases with relevance to works of Renaissance men, emphasizing development in Milan, Florence and Venice. Introduction to Baroque and Rococo style in art and architecture. Movement in Neoclassic style: Greek revival, Palladianism and influence of École des Beaux-Arts in development of early modernism.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Distinguish between various architectural styles emerged from 400 AD to 1800AD in Europe
CO 2	Identify phases of development of church architecture in Europe with relevance to structure, material culture and construction technique.
CO 3	Build a chronological framework for understanding the development of construction techniques
CO 4	Interpret verbally and in written, to questions regarding architectural history, design, and significance
CO 5	Apply critical thinking of the theories in the history of architecture **(Evaluation).**

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2								
CO 2	2						2	3	
CO 3	2					3		3	
CO 4	2						2		3
CO 5		2					3		

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	Semester-end examination
CO2	Simulation/field demonstration	Assignment, Semester-end examination

CO3	Lecture	Mid-term examination, Semester-end examination
CO4	Self-learning	Oral Presentation, Semester-end examination
CO5	Self-learning	Semester-end examination

Books Recommended

1. **Fletcher. B A;** History of Architecture, Architectural Press; 20th edition (21 Sep 1996)
2. **Fazio. M A;** World History of Architecture, Publisher: McGraw-Hill Professional;2nd Rev ed.
3. **Cole. E**; The Grammar of Architecture, Bulfinch
4. **Harvey. J. H.;** The Gothic World 1100-1600, London, 1950.
5. **Murray, P**; Architecture of the Renaissance, New York, 1971.
6. **Million, Henry, A. (ed);** The Triumph of the Baroque Architecture in Europe 1600-1750, London, 1999.
7. **Minor, V. H.;** Baroque and Rococo Art and Culture, London

Year/ Semester	**1st Year 2nd Semester**		
Course Title	**DT II: Theories and Methods in Architectural Design**		
Course Code	ARC 0731 1223	**Stream**	2
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

Design Theory, as a theoretical discourse, is absolutely fundamental and relevant in the learning process of Architecture. It not only incorporates the study of the basic visual and aesthetic languages, and systems in architectural practice, but also introduces the learners to the immensely diversified aspects of human society. The course will progressively guide the beginners through various aspects of human behavior in relation to Architectural creations and its material and psychosomatic dimensions. It also intends to inculcate in the students the methodological approach of design development as a combined process.

COURSE CONTENT:

Theory: A critical evaluation on the cultural origins of architecture, the basic understanding of its theory and practice in various social-cultural settings, analogies in architecture and its environment-behavior studies. An introduction and definition to visual design, architectural syntax, a critical analysis of form and space, visual elements in architectural design, ordering principles of design, spatial organization and circulation, proportion and scale in architecture, etc.

Methods: Methodological approach for architectural design and design process; Understanding of concepts, notions, ideas, design considerations in architecture; Types of concepts; Methods for developing ideas and concepts in architecture. Architectural Program formulation: Collection, organization and presentation of data to develop architectural program; Site planning: introduce students to the site and context as prime generators of design decisions; Spatial, behavioral and Perceptual context of site analysis and their relationship to the built environment. Post occupancy evaluation (POE): technical, functional and behavioral evaluation.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	apply theories and methodological approaches in architectural design
CO 2	distinguish ideas, design considerations, notions and concepts
CO 3	formulate design concepts by multiple processes
CO 4	apply scientific methods to formulate architectural programs
CO 5	Explain site-context relationship to the built environment.

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2						
CO 2	3	3					2		
CO 3	3	3				2			
CO 4			3			2			
CO 5		2				3			

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-Learning Strategy	Assessment strategy
CO1	Lecture	Semester-end examination
CO2	Lecture	Mid-semester examination, Semester-end examination
CO3	Workshops	Visual presentation, Semester-end examination
CO4	Self-learning	Mid-semester examination, Semester-end examination
CO5	Field survey/demonstration	Assignment(s), Semester-end examination

Books Recommended

Recommended:

1. **Ching, Francis D.K.** (2007)**;** *Architecture – Form, Space, and Order*; John Wiley and Sons; Boston
3. **Norberg-Schulz, Christian** (1965)**;** *Intentions in Architecture*; MIT Press; Cambridge
4. **Snyder, James C.** and **Catanese, Anthony J.** (1979) eds.**;** *Introduction to Architecture;* McGraw-Hill Publishing Company; NY

Supplementary:

1. **Ching, Francis D.K.** (2011)**;** *A Visual Dictionary of Architecture*; John Wiley and Sons; Boston

2. **Heath, Tom** (1984)**;** *Method in Architecture*; Wiley; NJ
4. **Unwin, Simon** (2009)**;** *Analysing Architecture*; Routledge; London
5. **Zelanski, Paul** and **Fisher, Mary P.** (1995)**;** *Design Principles and Problems*; Cengage Learning Publishing; Boston
1. **Peter Zumthor**: Thinking Architecture
2. **Leland M. Roth, Amanda C. Roth Clark**: Understanding Architecture: Its Elements, History, and Meaning
3. **Andrea Simitch, Val Warke**: The Language of Architecture: 26 Principles Every Architect Should Know
4. **Holger Kleine**: The Drama of Space
5. **Francis D. K. Ching and James F. Eckler**: Introduction to Architecture
6. **Andrew Charleson:**Precedents in Architecture: Analytic diagrams, Formative Ideas and Parts

Year/ Semester	**1st Year 2nd Semester**		
Course Title	**Design Studio II**		
Course Code	ARC 0731 1232	**Stream**	3
No. of Credits	6	**Course Hour**	12.0 hours/week

COURSE RATIONALE:

This is a foundation course for architectural design. This course intends to develop fundamental skills for visual design to give a basis for architecture design education.

COURSE CONTENT:

Relationship of Form and Space in three dimensions. Basic composition with color schemes; Lines, planes, primary shapes. Platonic solids and other geometric forms. Introduction to the process of form making. Interaction of Form and Space. Exposure to the domain of an architecture with simple functions. Study of a simple Architectural space.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	distinguish between visual design elements of different 3d forms
CO 2	apply visual design principles in 3-D compositions using addition, subtraction, interlocking, and platonic solids
CO 3	interpret basic design ideas and concepts verbally and in writing
CO 4	critically evaluate self-works and other basic compositions based on composition principles
CO 5	formulate basic compositions based on their individual ideas

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3							
CO 2	2	3					2		
CO 3	2						2		3
CO 4					2		3		
CO 5	2	3							2

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO 1	Case-study, Project	Assignment, Summative Assessment
CO 2	Project	Assignment, Continuous assessment, Summative Assessment
CO 3	Workshop	Presentation, Summative Assessment
CO 4	Project	Continuous assessment, Summative Assessment
CO 5	Project	Presentation (Individual), Continuous assessment, Summative Assessment

Books Recommended

1. **Pramar V.S.:** Design fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Nelhi, (1973)
2. **Ching, Francis D.K.**: Architecture: Form, Space, & Order, 4th Edition, Wiley (2014)
3. **Lawrence Bunchy C**.: Acrylic for Sculpture and Design, 450, West 33rd Street, New York, (1972)
4. **Exner V., Pressel D**.: "Basics Spatial Design", Birkhäuser (2009)
5. **Snyder, James C., Catanese, Anthony J.:** Introduction to Architecture, McGraw-Hill College (June 1, 1979)
6. **Kleine, Holger**: The Drama of Space, Birkhäuser; 1st edition (2017)

Year/ Semester	**1st Year 2nd Semester**		
Course Title	**ED I: Climate and Design**		
Course Code	ARC 0712 1241	**Stream**	4
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

The course presents an overview of Global Climatic factors, elements of climates; focusing on tropical climates. It covers basically, studies on how climatic factors affect human comfort and analysis of climatic problems in the design process.

COURSE CONTENT

Introducing concept of environmental design; Global climatic factors, Elements of climate, Classification & characteristics of tropical climates; Site Climate; Understanding thermal comfort: Man and his response to climate; Thermal balance of the human body, Thermal comfort indices, Effective temperature, CET, Comfort zone. Understanding Solar geometry: Apparent movement of the sun, Sun path diagrams (solar chart), Solar angles, Shadow angles, solar shading masks; Means of thermal control: mechanical & structural controls, Designing shading devices.

Introducing principles of thermal design in buildings: Thermal quantities, heat flow rate, conductivity (k–value) & resistivity, conductance through a multi-layered body, surface conductance, transmittance, calculation of U value, convection, radiation, concept of sol-air temperature & solar gain factor, thermal balance equation. Understanding Periodic heat flow in building: time lag & decrement factor & its application in selection of appropriate materials for walls & roof. Effect of Insulation & cavity on time lag & its practical use; Ventilation and air movement through and around the buildings.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	explain the impact of climate on building design process
CO 2	Integrate the climatic control devices in the design process
CO 3	analyze climatic factors that adverse or undermine human comfort in the living environment
CO 4	design context based architectural design with climatic considerations
CO 5	collect climatic data and process them for architectural design

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1		2				3			
CO 2	2	2				3			
CO 3	3	2							
CO 4		3				2			
CO 5		3	3		2				

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	Semester-end examination
CO2	Simulation/field demonstration	Assignment, Semester-end examination
CO3	Lecture	Mid-term examination , Semester-end examination
CO4	Self-learning	Oral Presentation, Semester-end examination
CO5	Self-learning	Semester-end examination

Books Recommended

1. **O.H. Koenigsberger:** Climate: Design Manual of tropical climate.
2. **M.S. Ingersoll**: Manual of tropical climate.
3. **M. Evans**: Housing, Climate & Comfort.
4. **B. Givoni**: Man, Climate & Architecture.
5. **Donald Watson & Kenneth labs**: Climatic Design.
6. **Norbert Lechner**: Heating, Cooling, Lighting: Sustainable Design Methods for Architects.
7. **M.A Muktadir**: Designing Building in the Tropics.

Year/ Semester	**1st Year 2nd Semester**		
Course Title	**Architectural Graphics II: Advanced Drawing**		
Course Code	ARC 0732 1252	**Stream**	5
No. of Credits	3.0	**Course Hour**	6.0 hours/week

COURSE RATIONALE:

This course intends to inculcate advanced graphical language and principles to represent architectural drawings, in the students.

COURSE CONTENT:

Execution of mechanical perspective; Introduction to shades, shadows, and reflections; Presentation & rendering.

Execution of single view drawings such as Axonometric drawings, and mechanical perspectives; Introduction to shades, shadows, and reflections; Presentation & rendering. Presentation techniques in various media.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	cast shade and shadow on 2D and 3D architectural drawings
CO 2	draw 3-dimensional drawings of a building such as axonometric view, perspective, etc.
CO 3	utilize proper techniques and instruments for drafting with ink
CO 4	render architectural presentation drawings with drafting pen and ink
CO 5	present a complete sheet of complex architectural building drawings

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3								
CO 2	3								3
CO 3									3
CO 4	3								3
CO 5									3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO 1	Project & Tutorial	Assignment, Summative Assessment
CO 2	Project & Tutorial	Assignment, Continuous

		assessment, Summative Assessment
CO 3	Project, Tutorial	Assignment, Summative Assessment
CO 4	Project, Tutorial, Self-learning using reference books	Assignment, Continuous assessment, Summative Assessment
CO 5	Project, Tutorial, Self-learning using reference books	Presentation (Individual), Summative Assessment

Books Recommended

1. **Ching, Francis D.K.**: Architectural Graphics
2. **Gill, Robert W.:** Rendering with Pen & Ink

Year/ Semester	**1st Year 2nd Semester**		
Course Title	**Physics for Architects**		
Course Code	PHY 0533 1211A	**Stream**	1
No. of Credits	2.0	**Course Hour**	2.0

COURSE RATIONALE

This course intends to teach fundamental laws and principles of physics with emphasis on the application of physical principles to the problems of architecture.

COURSE OBJECTIVES

- To provide basic idea about physics in relation with architectural design.
- To introduce concepts of temperature, heat, heat engines, laws of thermodynamics.
- Teach theory of lights and its characteristics and relation with architectural lighting.

COURSE CONTENT

Heat: Temperature, Humidity, Temperature related vapor and humidity, Heat transmission; Thermal Conductivity of solid and liquids, heat flow through different medium, convection, conduction, radiation, ventilation, laws of radiation, short and long-wave radiations. Light: Photometry and illumination, measurements and units; Theories of light and its characteristics, Lamps, diffraction and polarization; defect of images. Sound: Simple harmonic motion, wave motion, transmission and intens ity of sound waves, reflection, refraction and absorption of sound; units of sound intensity; building acoustics.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Explain how thermodynamics have impact on built environment.
CO 2	apply their fundamental knowledge of thermodynamics to next level courses
CO 3	relate the properties of light to making of space
CO 4	Explain the sound wave system and apply the basic of acoustic principles inside built environment.

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1						3			
CO 2		2	2					2	
CO 3		2						3	
CO 4		2				3		2	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	Mid-term examination , Semester-end examination
CO2	Self-learning	Assignment, Semester-end examination
CO3	Lecture	Mid-term examination , Semester-end examination
CO4	Lecture	Oral Presentation, Semester-end examination

Books Recommended

1. **Halliday and Resnick**: Physics I and II.
2. **Brijlal:** Heat and Thermodynamics.
3. **Brijlal:** A text book of sound.
4. **Brijlal:** Optics.
5. **Beiser:** Perspectives of modern physics.

Year/ Semester	**1st Year 2nd Semester**		
Course Title	**History of the Emergence of Independent Bangladesh**		
Course Code	SSS 0222 1213A	**Stream**	1
No. of Credits	3.0	**Course Hour**	3.0 hours/week

COURSE RATIONALE

This course deals with the following interrelated themes and topics that are essential to understand the emergence of Bangladesh. These themes include land and people, politics, economy, governance, society, religion and culture, global connections as well as the basic topics on the freedom struggle and War of Liberation. Issues under each of the broad themes will be discussed from the perspective of historical evolution and contemporary significance.

COURSE OBJECTIVES

- Offer insight into the historical changes, the long struggle for freedom and above all the War of Independence led by the Father of the Nation Bangabandu Sheikh Mujibur Rahman that have shaped today's Bangladesh.
- Describe impact of geographical features in Bengal
- Explore ethnic compositions of Bangladesh
- Understand the development of Bengali language and its impact in Bangladeshi culture

- Comprehend cultural syncretism and religious tolerance
- Realize distinctive identity of Bangladesh in the context of undivided Bangladesh

COURSE CONTENT

1. Description of the country and its people: Impact of Geographical features in Bengal, Ethnic composition of Bangladesh, Development of Bengali Language and its impact, Cultural syncretism and religious tolerance, Distinctive identity of Bangladesh in the context of undivided Bangladesh.
2. Proposal for undivided sovereign Bengal, the partition of the Subcontinent, 1947 and Foreshadowing Bangladesh: Rise of communalism under the colonial rule, Lahore Resolution 1940, The proposal of Suhrawardi and Sarat Bose for undivided Bengal: consequences, The creation of Pakistan 1947, Foundation of Awami Muslim League and Foreshadowing Bangladesh.
3. Pakistan: Structure of the state and disparity: Central and provincial structure, Influence of Military and Civil bureaucracy, Economic, social and cultural disparity.
4. Language Movement and quest for Bengali identity: Misrule by Muslim League and Struggle for democratic politics, The Language Movement: context, phases and International Recognition of Bengali Language, United front of Haque – Vasani – Suhrawardi: election of 1954, consequences.
5. Military rule: the regimes of Ayub Khan and Yahia Khan (1958-1971): Definition of military rules and its characteristics, Ayub Khan's rise to power and characteristics of hisrule (Political repression, Basic democracy, Islamisation), Fall of Ayub Khan and Yahia Khan's rule.
6. Rise of nationalism and the Movement for self-determination: Resistance against cultural aggression and resurgence of Bengali culture, Sheikh Mujibur Rahman and the 6 points movement, Reactions: Importance and significance, The Agortola Case 1968.
7. The mass- upsurge of 1969 and 11-point movement: Background, Program, Significance.
8. Election of 1970 and its Impact: Legal Framework Order (LFO), Programmed of different political parties, Election result and centers refusal to comply
9. Non-Cooperation Movement and 7th March Speech, 1971: The non-cooperation movement, Speech of 7th March: Background of the speech, major characteristics of the speech, impact of this speech, International recognition of 7th March Speech as part of world heritage.
10. Declaration of Independence of Bangladesh: Operation Searchlight, declaration of Independence of Bangladesh by Bangabandhu, Beginning of the Liberation War of Bangladesh
11. The war of Liberation 1971:
    a) Genocide, repression of women, refugees, Formation of Bangladesh government and proclamation of Independence, The spontaneous early
    b) resistance and subsequent organized resistance (Mukti Fouz, Mukti Bahini,
    c) guerillas and thefrontal warfare), Publicity Campaign in the war of Liberation
    d) (Shdhin Bangla Betar Kendra, the Campaigns abroad and formation of public
    e) opinion), Contribution of students, women and the masses (Peoples war) and
    f) different political parties, The role of Great powers and the United Nations in
    g) the Liberation war, The contribution of India in the Liberation War, The Anti
    h) liberation activities of the occupation army, the Peace Committee, Al-Badar,
    i) Al-Shams, Rajakars, pro Pakistan political parties and Pakistani Collaborators
    j) killing of the intellectuals, Trial of Bangabandhu and reaction of the World
    k) Community, Formation of joint command and the Victory, The overall
    l) Contribution of Bangabandhu in the Independence struggle.
    m) The Bangabandhu Regime 1972-1975: Homecoming, Making of the constitution, Reconstruction of the war-ravaged country, Foreign Policy of Bangabandhu, The murder of Bangabandhu and his family and the ideological turn-around.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	A broader understanding and further curiosity of the rich history, culture and heritage of the country.
CO 2	Able to appreciate the importance and relevance of history as a bridge between the past, present and the future.
CO 3	Become familiar with the contribution of the Father of the Nation Bangabandu Sheikh Mujibur Rahman during independent war and construction of Bangladesh.
CO 4	Realize the nationalism and self-determination
CO 5	Improve critical thinking on anti-Bangladeshi activities during liberation war and after the independence and present days

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1									
CO 2		2							
CO 3		2							
CO 4				2					
CO 5							2		

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	Mid-term examination 1, Semester-end examination
CO2	Self-learning	Assignment, Semester-end

		examination
CO3	Lecture	Mid-term examination 2, Semester-end examination
CO4	Lecture	Semester-end examination
CO5	Self-learning	Oral Presentation, Semester-end examination

Books Recommended

1. Ahmed, Salahuddin and Bazlul Mobin Chowdhury (eds.): Bangladesh: National Culture and Heritage: An Introductory Reader (Dhaka: Independent University Bangladesh, 2004).
2. Harun-or-Roshid: The Foreshadowing of Bangladesh: Bengal Muslim League andMuslim Politics, 1906-1947 (Dhaka: The University Press Limited, 2012)
3. Jahan Rounaq: Pakistan: Failure in National Integration, (Dhaka: The University Press Limited, 1977)
4. ManiruzzamanTalukder: Radical Politics and the Emergence of Bangladesh, (Dhaka: Mowla, Brothers, 2003)
5. Muhith, A M A: History of Bangladesh: A Subcontinental Civilization, (Dhaka: UPL, 2016)
6. Samad Abdus: History of Liberation War of Bangladesh, (Dhaka: Aparajeyo Bangla Prakashani, 2019)
7. Milton Kumar Dev, Md. Abdus Samad, History of Bangladesh, (Dhaka: Biswabidyalya Prokasoni, 2014)
8. Schendel, Willem Van: A History of Bangladesh (Cambridge: Cambridge University Press, 2009)
9. bxnvi iÄb ivqt evOvjxi BwZnvm, (KjKvZvt †`ÕR cvewjwks, 1402 e½vã)
10. mvjvnDwÏb Avn‡g` I Ab¨vb¨ (m¤úvw`Z)t evsjv‡`‡ki gyw³ msMÖv‡gi BwZnvm 1947-1971 (XvKvt AvMvgx cÖKvkbx, 2002)
11. Aveyj gvj Ave`yj gywnZt evsjv‡`kt RvwZiv‡ó«i D™¢e (XvKvt mvwnZ¨ cÖKvk, 2000)
12. wmivRyj Bmjvg (m¤úvw`Z)t evsjv‡`‡ki BwZnvm 1704-1971, 3 LÛ (XvKvt GwkqvwUK †mvmvBwU Ae evsjv‡`k, 1992)
13. gybZvwmi gvgyb I Ab¨vb¨t ¯^vaxb evsjv‡`‡ki Af¨y`‡qi BwZnvm (XvKvt myeY©, 2017)
14. W. Avey †gv. †`‡jvqvi †nv‡mbt ¯^vaxb evsjv‡`‡ki Af¨y`‡qi BwZnvm (XvKvt wek¦we`¨vjq cÖKvkbx, 2014)
15. W. Avey †gv. †`‡jvqvi †nv‡mbt W. †gvnv¤§` †mwjg (m¤úv`bv)t evsjv‡`k I ewnwe©‡k¦ (XvKvt evsjv‡`k BwZnvm mwgwZ, 2015)
16. W. Avey †gv. †`‡jvqvi †nv‡mbt evsjv‡`‡ki BwZnvm 1905-1971 (XvKvt wek¦we`¨vjq cÖKvkbx, 2016)

Year/ Semester	**2nd Year 1st Semester**		
Course Title	**Art and Architecture III: Modern and Contemporary Architecture**		
Course Code	ARC 0731 2121	**Stream**	2
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

This course will explore the historical and philosophical considerations of Modernism movement, its emergence, contribution and declination, and The journey towards the Contemporary practice in architecture around the world, alongside parallel artistic, political and social movements, in order to synthesize a greater theoretical context of this present notion of architecture.

COURSE CONTENT:

Beginnings of modernity, Industrialization, World War and Urbanization, The Chicago school movement, Arts and Crafts movement, Art Nouveau, Prairie style, Adolf Loos and critique of ornamentation, Werkbund, Expressionism, Futurism, Constructivism, Cubism, De–Stijl, Modern architecture institutionalization: Bauhaus, Modernism in Scandinavia, International style, Significant works of Modernism architects: FL Wright, Le Corbusier, Mies Van Der Rohe, Alvaro Aalto and Louis I. Kahn. Spread of Modern architecture: Tradition and Identity in the developing World.

Crisis of Modernism, Postmodernism as a reaction to Modernism; Theories and concepts of contemporary architecture; Deconstruction, Traditionalism and critical regionalism, technological advancement, postmodern ecology and sustainable architecture. Impact of globalization and open market system; Significant works of contemporary architects; Contemporary architecture in South Asia. Trends of post-independence architecture, adaptation to modernism through works of early modernist architects. Study of Architectural identity and regionalism in architecture in refer to works of local masters in South Asian region.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	explain the historical, socio-cultural, geopolitical and philosophical notion of the time that influenced modern and contemporary architecture
CO 2	identify the factors that made the movement complex and flourish around the world
CO 3	recognize notable architects, their thoughts and master creations
CO 4	evaluate the role of the movements on the development of later trends of Architecture
CO 5	generate new ideas and mark footprint in this discourse

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1		3					3		
CO 2							3		
CO 3	3					2	2		
CO 4							3		
CO 5	2	2					2		2

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture using projector	Midterm Examination 1, Semester-end examination
CO2	Self-learning using reference	Midterm Examination 2, Semester-end examination
CO3	Lecture using projector	Semester-end examination
CO4	Guest lectures/field visit	Quiz, Semester-end examination
CO5	Field demonstration	Assignment, Semester-end examination

Books Recommended

1. **Kenneth Frampton**: Modern Architecture: A Critical History.
2. **William J. Curtis**: Modern Architecture since 1900.
3. **Manfredo Tafuri**: Modern Architecture.
4. **Leonardo Benevolo**: History of Modern Architecture.
5. **Miki Desai et. al**: Architecture and independence.
6. **Charles Jencks** Post Modern Architecture
7. **Steve Bowkett**: Archi doodles.
8. **Jens Müller**: Logo Modernism.
9. **Paul Sahre**: Two-dimension Man.
10. **Robert Bringhurst**: The Elements of Typographic Style.
11. **Frank Jacobus**: Archi-Graphic: An Info graphic Look at Architecture.

Year/ Semester	**2nd Year 1st Semester**		
Year/ Semester	**2nd Year 1st Semester**		
Course Title	**Design Studio III**		
Course Code	ARC 0731 2132	**Stream**	3
No. of Credits	6.0	**Course Hour**	12.0 hours/week

COURSE RATIONALE:

This course is an introductory building design course for the architecture students as it teaches the students to implement architecture design methodologies and exercise multiple design project work through entire course

COURSE CONTENT:

Study of anthropometry and ergonomics; Study of relationship between man – space –form –function. Introduction to scale and proportion in architecture; Understanding of environmental features interacting in shaping the architecture. Learn how to establish logic behind design decisions and exercise critical thinking to guide the spatial design.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Apply functional and ergonomic design process
CO 2	Formulate various spatial organizations and functional arrangements
CO 3	Translate conceptual sketches to design three-dimensional space
CO 4	Relate formal expressions with spatial sequences (indoor, semi-outdoor, outdoor, etc.) and their proportion
CO 5	Utilize site surroundings and site forces for generating architectural design

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3					2		
CO 2	3	3				2			
CO 3	2	3					2		2
CO 4	3	3					2		2
CO 5	2	3				3	2		

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Project, case study, workshop	Continuous assessment, Summative assessment
CO2	Project, self-learning	Continuous assessment, Summative assessment
CO3	Project, self-learning	Continuous assessment, Summative assessment
CO4	Project, self-learning	Continuous assessment, Summative assessment
CO5	Project, field demonstration	Continuous assessment, Summative assessment

Books Recommended

1. **De Chiara, J.:** Time Saver Standards for Building Types
2. **Pickard, Q. (ed):** The Architects Handbook
3. **Ching, Francis D.K.**: Architecture: Form, Space, & Order, 4th Edition, Wiley

Year/ Semester	**2nd Year 1st Semester**		
Course Title	**ED II: Design in the Tropics**		
Course Code	ARC 0712 2141	**Stream**	4
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

ED-I provides the foundation knowledge of climatic aspects and thermal design. Implementing theoretical concepts and technical knowledge in practical application is important for architects. ED-II course helps the students to specify climatic zones

and their characteristics and study their design responses. Also, it equips the students with the methodological skills to integrate climatic data with the design process and maintain a comfortable living environment in different tropical climates.

COURSE CONTENT:

Theories and concepts: Understanding climatic characteristics and traditional design responses in different climatic zones. Design considerations for warm-humid, hot-dry, composite and tropical upland climates. Geo-physical forces and response to climate. Built-form design and layout planning. Passive cooling for hot-dry and warm-humid climates. Passive solar planning: direct-gain, Trombe wall and sunspace system, thumb rules for maximizing passive solar.

Design Methods: Climate-responsive and environmental design process. Analysis, synthesis and evaluation of climatic data. The Mahoney tables: indicators and specifications. Forward analysis of design scheme. Interpretation of climatic data and plan development. Climate-responsive building element design. Shading device design principles. Building performance modelling and analogues.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	determine design objectives for different climatic conditions.
CO 2	Apply climate-responsive design techniques for built-forms and their elements in different climatic zones.
CO 3	interpret climatic design strategies from traditional built-forms and planning techniques.
CO 4	analyze the climatic data in the environmental design process.
CO 5	simulate experiments with scaled models to evaluate building performance and energy efficiency.

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONAL SKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3					3			
CO 2	2	3				2		3	
CO 3		2						3	
CO 4			3			3			
CO 5			3					3	3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-Learning Strategy	Assessment strategy
CO1	Lecture with Projector, Documentaries	Midterm Examination 1, Assignment, Semester-end examination
CO2	Lecture with Projector, Documentaries	Midterm Examination 1, Assignment, Semester-end examination
CO3	Lecture with Projector, Documentaries	Midterm Examination 2, Assignment, Semester-end examination
CO4	Lecture with Projector, Workshop	Midterm Examination 2, Group Presentation, Semester-end examination
CO5	Tutorial, Simulation/Field Demonstration	Group Presentation, Semester-end examination

Books Recommended

1. Koenigsberger, O. H. et al. (1973). ***Climatic Design: Manual of tropical housing and building*.** Orient Longman Private Limited: Chennai, India
2. Lechner, Norbert (2015). ***Heating, Cooling, Lighting: Sustainable Design Methods for Architects.*** John Wiley & Sons, Inc.: New Jersey, USA
3. Koch-Nielsen, Holger (2002). ***Stay Cool - A Design Guide for the Built Environment in Hot Climates***. Earthscan: London
4. Watson, Donald and Labs, Kenneth (1983). ***Climatic Design: Energy-efficient Building Principles and Practices.*** McGraw-Hill: New York, USA
5. Evans, Martin (1980). ***Housing, Climate and Comfort.*** Architectural Press LTD: London
6. Givoni, Baruch (1976). ***Man, Climate & Architecture.*** Applied Science Publishers, Ltd.: London
7. Bay, Joo-Hwa and Ong, Boon Lay (2006). ***Tropical Sustainable Architecture***. Elsevier Ltd.: Oxford

Year/ Semester	**2nd Year 1st Semester**		
Course Title	**Ecology and Environment**		
Course Code	ARC 0521 2143	**Module**	4
No. of Credits	2.0	**Course Hour**	2 hours/week

COURSE RATIONALE:

This course intends to improve knowledge and design-skills for ecological and environmental considerations in architecture. Understanding the environment and the eco-system is fundamental for built-environment design in urban and natural settings.

COURSE CONTENT:

Definition and Field of Ecology; Origin and development of ecological study; Levels of Organization in ecology; Types of Ecology, Ecological Network, Factors and Relationships; Organism, Evolution and adaptation; Ecological communities and interaction; Biosphere and biodiversity; Trophic levels and Flow of Energy.

Relationship of eco-systems with built-environment; Human ecology and resource management; Environmental pollution and mitigation measures; Global initiatives in ecological sustainability; Concepts of ecological conservation (soil, water, air and

biodiversity); Applied ecology and Eco-centric design concepts e.g. bio-mimicry, cradle to cradle design, industrial ecology.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Explain the basic fundamentals of ecology and environment
CO 2	distinguish the relationship between architecture and its environment
CO 3	Identify the environmental issues, biodiversity and interrelations in local context
CO 4	Apply measures of ecological conservation and sustainability in design
CO 5	Conceptualize environmental techniques and awareness to ensure better future

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs:

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2		2						
CO 2	2					3			
CO 3			2			3			
CO 4		2					2		
CO 5						3	2		2

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture using projector	Midterm Examination 1, Semester-end examination
CO2	Self-learning using reference	Midterm Examination 2, Semester-end examination
CO3	Lecture using projector	Semester-end examination
CO4	Guest lectures/field visit	Quiz, Semester-end examination
CO5	Field demonstration	Assignment, Semester-end examination

Books Recommended

1. **Eugene P. Odum and Gray W. Barret**: Fundamentals of Ecology
2. **David L. Jones**: Architecture and the Environment
3. **G E Thompson, F R Steiner**: Ecological Design and Planning
4. **A. Ambelu, B Deboch, D Lenjissa**: Ecology
5. **Peter D. Stiling:** Ecology- theories and Applications
6. **H.D. Kuma**: Modern Concepts of ecology

Year/ Semester	**2nd Year 1st Semester**
Course Title	**Computer Aided Design**

Course Code	ARC 0211 2152	**Stream**	5
No. of Credits	2.0	**Course Hour**	4.0 hours/week

COURSE RATIONALE:

This course intends to train students to apply digital tools for design drawings and presentation by developing skills in computer graphics software for image making, editing, post-processing and vector graphics illustration.

COURSE CONTENT:

Basic computer application; To understand and to use graphic software in Architectural presentation and design. Introduction to vector and raster graphics software (e.g., Photoshop, Illustrator, CorelDraw) and their application; Introduction to computer aided design, using suitable Computer Aided Design through Design projects, 2-D graphics and 3-D modeling with the help of software (e.g., AutoCAD, 3D studio Max, Sketch-up, Rhino); Rendering in different platforms (e.g., V-Ray, Lumion); Developing understanding of complex form, lighting conditions and material mapping in simulated environment**.**

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	implement the technical aspects of computer graphics applications used in all visual formats.
CO 2	perform image editing and prepare presentation with graphic applications.
CO 3	visualize design ideas through illustrations with digital tools and digitally create, manipulate and edit 2D architectural drawings
CO 4	attain professionalism and communication skills through involvement of lab-based teamwork, sharing professional graphic design sample and competitive design projects
CO 5	apply computer-aided 3-D visualization as an efficient way of representation/ exhibition of the designed product.

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3							3	
CO 2								3	2
CO 3						2		3	2
CO 4				3					2
CO 5	2							3	3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture using projectors	Continuous assessment (CA), Summative assessment (SA)

CO2	Simulation/field demonstration	Presentation (Individual/group) /Viva voce, Summative assessment (SA)
CO3	Simulation/field demonstration	Presentation (Individual/group) /Viva voce, Summative assessment (SA)
CO4	Self-learning using reference book/research article/case study/other online materials	Assignment, Summative assessment (SA)
CO5	Simulation/field demonstration	Presentation (Individual/group) /Viva voce, Summative assessment (SA)

Books Recommended

1. Pradeep Mamgain: Autodesk 3Ds Max 2020: A Detailed Guide to Modeling, Texturing, Lighting, and Rendering, 2nd Edition.
2. Munir Hamad: AutoCAD 2020, Beginning and Intermediate.

Year/ Semester	**2nd Year 1st Semester**		
Course Title	**Structure I - Basic Mechanics**		
Course Code	CEE 0732 2111A	**Stream**	1
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

This course facilities for gathering the basic knowledge about the effects of force on solid mass and to develop student's ability to visualize the distribution of forces on a solid body. This course will also offer knowledge of centroids, friction, moment of inertia and flexible chords. This knowledge is a prerequisite for many engineering courses offered in the subsequent semesters that capture the detailed analysis and design of engineering structures or structural components.

COURSE OBJECTIVES

- To introduce rigid body mechanics. Equivalent force systems: concepts of moment, couple, resultant. Equilibrium: free-body diagram; equations of equilibrium. Structural analysis: trusses by method of sections and method of integration,
- To develop skills to determine the location of the center of gravity and centroid for a system of discrete particles and a body of arbitrary shape,
- To develop the ability for determining the moment of inertia for areas of different geometric configurations, and
- To familiarize with the basic theory of Flexible cords and Flexible chords..

COURSE CONTENT

Statics of particles:

This chapter is devoted to the study of forces contained in a single plane. The analysis of forces in three-dimensional space is also analyzed here.

Rigid bodies: Equivalent systems of forces

In this chapter, the effect of forces exerted on a rigid body, and how to replace a given system of forces with a simpler equivalent system is shown.

Centroids:

Definitions, Center of gravity, Mass center and Centroid, Centroids of Areas, Principle of Symmetry, Integrating for Centroids (Arc of a Circle, Plane Triangle, Sector of Circle, Area without an axis of symmetry, Right circular cone), and Composite figures are discussed and determined in this chapter.

Moment of inertia of areas:

Introduction, Rectangular moment of inertia, Polar moment of inertia, Radius of gyration, Determination of moment of inertia (Rectangle, Triangle, Circle), Transfer formula-parallel axes, Choice of the differential element, Composite areas, and Product of inertia are discussed and determined in this chapter.

Fundamentals of friction:

This chapter presents frictional force, limiting frictional force, coefficient of kinetic friction, laws of friction, angle of friction, and belt friction.

Fundamentals of flexible cords:

This chapter shows how to solve and analyze the parabolic chord and the catenary.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Draw complete free-body diagrams and write appropriate equilibrium equations from the free-body diagram, including the support reactions on a structure
CO 2	Locate the centroid of an area, center of mass, center of volume effectively
CO 3	Calculate the moment of inertia of areas for different geometric configurations
CO 4	Determine the coefficient of friction and the resultant tension of flexible chords and
CO 5	Relate and apply fundamental sciences for learning the essential engineering concepts and theories of different branches.

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2							3	
CO 2	2					2		3	
CO 3	2					2		3	
CO 4	2							3	
CO 5	2							3	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture with projector	Mid-term examination 1, Semester-end examination
CO2	Lecture, Self-learning	Assignment, Semester-end examination

CO3	Lecture with projector	Mid-term examination 2, Semester-end examination
CO4	Lecture with projector	Semester-end examination
CO5	Lecture with projector	Presentation, Semester-end examination

Books Recommended

1. Andy Ruina and Rudra Pratap, Introduction to Statics and Dynamics, Oxford University Press, 2011
2. F. P. Beer and E. R. Johnston, Vector Mechanics for Engineers, Vol I - Statics, Vol II – Dynamics, 9th Ed, Tata McGraw Hill, 2011.
3. H. Shames, Engineering Mechanics: Statics and dynamics, 4th Ed, PHI, 2002.
4. J. L. Meriam and L. G. Kraige , Engineering Mechanics, Vol I – Statics, Vol II –Dynamics, 6th Ed, John Wiley, 2008.
5. R. C. Hibbler, Engineering Mechanics: Principles of Statics and Dynamics, Pearson Press, 2006.
6. R.S. Khurmi, Engineering Mechanics, S.Chand and Co., 2001
7. V.M. Faires and S.D. Chambers, Analytic Mechanics, 3rd Ed, The Macmillan Company, 2001.

Year/ Semester	**2nd Year 1st Semester**		
Course Title	**Architectural Sketching & Modelling**		
Course Code	ARC 0213 2154	**Stream**	5
No. of Credits	2.0	**Course Hour**	4.0 hours/week

COURSE RATIONALE:

Sketching and model-making are integral part of architectural communication. This course intends to teach the students efficient ways to communicate through using these media.

COURSE CONTENT:

Introducing sketching and modelling as means of architectural communication. Provide the student with the knowledge, skills and aptitude required to use a range of fundamental architectural sketching and modeling skills based on observation of the physical world, in particular the built world. Sketching as a tool for design idea development and architectural representation. Students will be encouraged to maintain a sketchbook to record all their visual and conceptual research, and in which to draw on regular basis as a means to develop ideas and technical proficiency. Methods of model making with different materials and tools. Students will be assigned in different studio projects to develop skill in 3d model making. In addition to architectural scaled model making, students will be engaged to life scale installations to learn the techniques of using wood, steel, brick, concrete, clay and other building materials to create innovative structures.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Improve hand-eye coordination and line quality
CO 2	Draw perspective with innovative tools (string, table, etc.)

CO 3	Apply rendering techniques of 3D sketch.
CO 4	Making architectural scaled models
CO 5	Build small-scale Parametric 3D installation and human-scale installation

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1		2						3	3
CO 2		2						3	3
CO 3		2						3	3
CO 4		2						3	3
CO 5		2						3	3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Workshop, self-learning	Continuous assessment, Summative assessment
CO2	Workshop, self-learning	Continuous assessment, Summative assessment
CO3	Workshop, self-learning	Continuous assessment, Summative assessment
CO4	Workshop, project, self-learning	Continuous assessment, Summative assessment
CO5	Workshop, project, seminar	Continuous assessment, Summative assessment

Books Recommended

1) **Gabriel Campanario**: The Urban Sketching Handbook: Architecture and Cityscapes
2) **Harold Speed**: The Practice and Science of Drawing
3) **Arthur Wesley Dow**: Composition
4) **Betty Edwards:** Drawing on the right side of the brain
5) **Léon Krier, James Howard Kunstler:** Drawing for Architecture
6) **Stephanie Travis**: Sketching for Architecture + Interior Design

Year/ Semester	**2nd Year 1st Semester**		
Course Title	**Photography and Media Studies**		
Course Code	ARC 0211 2156	**Stream**	5
No. of Credits	2.0	**Course Hour**	4.0 hours/week

COURSE RATIONALE:

The course aims to introduce the theory, history, concepts and practices in photographic art and explores its technique(s) as an essential component to the visual basics in the architectural learning process.

COURSE CONTENT:

Introduction to photographic art, photography as an independent stream of art, basic conception of image making and processing, importance of photography in architectural study and documentation, operations of camera, types of camera, technicalities of a camera, and experimentations through various photographic projects – techniques and style.

Examining the relationship between architecture and media, critical examination of the historical and contemporary modes in which architecture engages with media and its study, media(s) in architectural presentation, photography as a media, and so on.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	develop skills to examine the chronological advancement of photography as a technology and an independent branch of art
CO 2	Explain the technical aspects, modes and methods of photography and photographic reproduction
CO 3	apply the knowledge to incorporate photography as a tool and representational technology in architecture
CO 4	develop the ability to integrate visual communication skills and interpret the basic visual languages of photography
CO 5	apply critical thinking in the process of visual creation

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL		SOCIAL SKILL		THINKING SKILL		PERSONALSKILL		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1		2							
CO 2									3
CO 3		2					2		3
CO 4									3
CO 5							2		3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-Learning Strategy	Assessment strategy
CO1	Lecture	Summative assessment
CO2	Project demonstrations	Assignment(s), Summative assessment
CO3	Project demonstrations	Assignment(s), Summative assessment
CO4	Project demonstrations	Assignment(s), Summative assessment
CO5	Project demonstrations	Assignment(s), Summative assessment

Books Recommended

1. **Barnbaum, B.** (1994)**;** *The Art of Photography: An Approach to Personal Expression*; Rocky Nook; US
2. **Carroll, H..** (2014)**;** *Read This If You Want to Take Great Photographs*; Laurence King Publishing; US
3. **Lenman, R.** (2008)**;** *The Oxford Companion to the Photograph*; Oxford University Press; UK
4. **NGS US** (2011)**;** *National Geographic – Complete Photography;* NGS; US

Year/ Semester	**2nd Year 1st Semester**		
Course Title	**Graphic Art and Design**		
Course Code	ARC 0211 2151	**Stream**	5
No. of Credits	2.0	**Course Hour**	4.0 hours/week

COURSE RATIONALE:

This course intends to teach the students the application of graphical reproduction in architecture and related design media.

COURSE CONTENT:

Basic techniques used in graphic art. Selection of drawing instruments, surfaces, typography. Graphic reproduction techniques and the pros and cons of the different systems to achieve the most effective presentation. Design of posters, products, display, portfolio.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	apply the knowledge to incorporate Graphic Art as a tool and representational technology in collaborative environments
CO 2	distinguish various graphical media and their application in Architecture
CO 3	develop skills to problem-solving through enhancing visual communication
CO 4	
CO 5	Illustrate book covers and magazines
CO 6	Create 2D, 3D product design and portfolio

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	2					2		
CO 2									3
CO 3									3
CO 4							2		
CO 5							2		3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy

CO1	Project, lecture	Continuous assessment, Summative assessment
CO2	Project, lecture	Continuous assessment, Summative assessment
CO3	Project, lecture	Continuous assessment, Summative assessment
CO4	Project, lecture	Continuous assessment, Summative assessment
CO 5	Project, lecture	Continuous assessment, Summative assessment

Books Recommended

1. **Steve Bowkett**: Archi doodles.
2. **Jens Müller**: Logo Modernism.
3. **Karen Lewis**: Graphic Design for Architects: A Manual for Visual Communication.
4. **Paul Sahre**: Two-dimension Man.
5. **Robert Bringhurst**: The Elements of Typographic Style.
6. **Frank Jacobus**: Archi-Graphic: An Info graphic Look at Architecture

Year/ Semester	**2nd Year 1st Semester**		
Course Title	**Introduction to Programming With Python (Theory)**		
Course Code	CSE 0613 2113A	**Stream**	1
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

In this current world, most of the research works require computational data analysis of corresponding fields. This requirement has emphasized the necessity of a knowledge of computer programming for all the researchers. For research-related purposes, computer programming using Python is one of the best choices. This course is designed with the purpose to make students acquainted with programming using python and make them comfortable to deal with computational data analysis.

COURSE OBJECTIVES:

- Help them conceptualize basic theories of computer programming
- Make the students understand fundamental components of python programming
- To develop skills for writing computer programs using all necessary branches of Python
- Accumulate basic ideas about data structures and data manipulations

COURSE CONTENT:

Computer Basics: Concept on Computer Hardware, Software and its classification, Compiler vs Interpreter. **Using the Python Interpreter:** Invoking the Interpreter, Argument Passing, Interactive Mode, The Interpreter, and Its Environment, Source Code Encoding; **An Informal Introduction to Python:** Using Python as a Calculator- Numbers, Strings, Lists. First Steps Towards Programming; **More Control Flow Tools:** if Statements, for Statements, The range() Function, break and continue Statements, and else Clauses on Loops, pass Statements, Defining Functions; **More on Defining Functions:** Default Argument Values, Keyword Arguments, Arbitrary Argument Lists, Unpacking Argument Lists, Lambda Expressions, Documentation Strings, Function Annotations, **Intermezzo:** Coding Style; **Data Structures:** More on Lists- Using Lists as Stacks, Using Lists as Queues, List Comprehensions, Nested List Comprehensions, The del statement, Tuples and Sequences, Sets, Dictionaries, Looping Techniques, More on Conditions, Comparing Sequences and Other Types; **Modules:** More on Modules- Executing modules as scripts, The Module Search Path, Compiled" Python files, Standard Modules, The dir() Function, Packages- Importing * From a Package, Intra-package References, Packages in Multiple Directories, matplotlib, numpy, other common necessary packages; **Input and Output:** Fancier Output Formatting, Old string formatting, **Reading and Writing Files**: Methods of File Objects, Saving structured data with JSON; **Errors and Exceptions:** Syntax Errors, Exceptions, Handling Exceptions, Raising Exceptions, User-defined Exceptions, Defining Clean-up Actions, Predefined Clean-up Actions. **Classes:** A Word About Names and Objects, Python Scopes and Namespaces, Scopes and Namespaces Example, A First Look at Classes, Class Definition Syntax, Class Objects, Instance Objects, Method Objects, Class and Instance Variables, Random Remarks, Inheritance, Multiple Inheritance, Private Variables, Odds and Ends, Iterators, Generators, Generator Expressions.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Design solutions of real-life problems using necessary components of Python
CO 2	Identify errors from a program and use exception handlers to handle errors and exceptions
CO 3	Implement Object Oriented Programming and modular concepts
CO 4	Design basic data structures to solve efficient data storage issues
CO 5	Apply knowledge of programming in data analysis and manipulation

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1		2						2	
CO 2						2			
CO 3		2				2			
CO 4						2			
CO 5						2			

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-Learning Strategy	Assessment strategy
CO1	Class Lectures, Textbook, Online Resources, Group	Assignment, Lab Examination

	Discussion	
CO2	Class Lectures, Textbook, Online Resources, Group Discussion, Problem-based Learning, Project-based Learning	Assignment, Lab Examination, Programming Problems
CO3	Class Lectures, Textbook, Online Resources, Problem-based Learning, Project-based Learning	Assignment, Programming Problems, Projects
CO4	Group Discussion, Problem-based Learning, Project-based Learning, Blended Learning	Viva-voce, Presentation, Report Writing, Projects
CO5	Group Discussion, Problem-based Learning, Project-based Learning, Blended Learning	Viva-voce, Presentation, Report Writing, Projects

Books Recommended

1. Learning Python, By Mark Lutz, 5thEdition
2. Think Python, By Allen B. Downey
3. The Python Tutorial, Official documentation of Python

Year/ Semester	**2nd Year 2nd Semester**		
Course Title	**Art and Architecture IV: South Asian Architecture**		
Course Code	ARC 0731 2221	**Stream**	2
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

This course intends to develop skills for cultural interpretation of built environment through literature survey and analysis of historic structures of Indian Sub-continent, as those are certainly the significant predecessors of modern-day architecture of Bangladesh.

COURSE CONTENT:

The course will include the basic essence of south Asian Architecture associating chronological development in the early age. Study of art and Architecture in the South Asia with special emphasis on the styles of the Vedic, Buddhist and Hindu periods up to the 17th century

Critical evaluation of the art and architecture under the Muslim rule in South Asia. The course will conclude with Sources of Muslim Architecture in South Asia Region; Imperial style; Sur or Pathan period; Mughal period. The emphasis will be laid on the medieval developments in continuation to its earlier roots.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	distinguish key stylistic features and various architectural styles emerged from 800 - 1700AD in Indian sub-continent
CO 2	Analyze the architectural styles and its form, functions development in Indian sub-continent with relevance to structure, material culture and construction technique
CO 3	Critically evaluate the art and architecture of the Vedic, Buddhist, Hindu and Muslim periods in South Asia, including the ways in which they have evolved over time and been influenced by external discourses
CO 4	Explain the knowledge across time and context that how the indigenous and religious factors shaped the architecture
CO 5	Apply the knowledge to reconstruct history through social, political and the cultural diversity and complexity

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONAL SKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2		3						
CO 2			3			3		2	
CO 3		2	3			3			
CO 4	2	2				3			
CO 5			3				3		

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-Learning Strategy	Assessment strategy
CO1	Lecture	Midterm Examination 1 Presentation (Individual/group), Semester-end Examination
CO2	Lecture	Midterm Examination 1, Semester-end Examination
CO3	Documentaries, Guest lectures	Semester-end Examination 2, Semester-end Examination
CO4	Lecture, Workshop	Semester-end Examination 2, Presentation (Individual/group), Semester-end Examination
CO5	Lecture	Semester-end Examination 2, Semester-end Examination

Books Recommended

1. Grover, S. (1980). ***Buddhist and Hindu Architecture in India.***
2. Brown, P. (1965). ***Indian Architecture (Buddhist and Hindu Period)***
3. Grover, S. (1996). ***Islamic Architecture in India.***
4. Brown, P. (1965). ***Indian Architecture (Islamic Period)***
5. Edwards, M. (1969). ***Indian Temples and Palace***.
6. Koch, E. (1991).***Mughal Architecture***
7. Harle, J. C. (1994). ***The art and architecture of the Indian subcontinent***

Year/ Semester	**2nd Year 2nd Semester**

Course Title	Field Work I: Contemporary Architecture		
Course Code	ARC 0731 2222	Stream	2
No. of Credits	1.0	Course Hour	1 week

COURSE RATIONALE:
This course plays a supplementary role to the corresponding theory courses on modern and contemporary architecture in Bangladesh.

COURSE CONTENT:
Students will visit contemporary buildings in Bangladesh to acquire practical knowledge. Students have to submit a report based on their fieldwork experience.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	explain the development of Bengal architecture during the modern and contemporary periods from practical experience
CO 2	implement documentation and analytical process of historical /contemporary buildings.
CO 3	prepare verbal and visual presentations on contemporary Bengal architecture
CO 4	identify the contemporary construction techniques and building service design
CO 5	evaluate the contemporary architecture of Bengal with relation to socio-cultural, socio-political, environmental and ecological contexts

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1					2	2			
CO 2		2							
CO 3									3
CO 4		2				2			
CO 5		2				3			

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Workshop, Field visit	Assignment, Summative assessment
CO2	Documentaries, Guest lectures	Assignment, Summative assessment
CO3	Lecture	Presentation (Individual/group) /Viva voce, Summative assessment
CO4	Workshop, Field visit	Presentation (Individual/group) /Viva voce, Summative assessment
CO5	Workshop, Field visit	Presentation (Individual/group) /Viva voce, Summative assessment

Books Recommended

1. **Niklaus Graber, Andreas Ruby, Viviane Ehrensberger**: Bengal Stream- The Vibrant Architecture Scene of Bangladesh; CMV
2. **Saif Ul Haque, Raziul Ahsan, Kazi Khaleed Ashraf**: Pundra Nagar to Sherebangla Nagar; Architecture in Bangladesh; Chetana Sthapatya Unnayan Society

Year/ Semester	2nd Year 2nd Semester		
Course Title	Design Studio IV		
Course Code	ARC 0731 2232	Stream	3
No. of Credits	6.0	Course Hour	12.0 hours/week

COURSE RATIONALE
This course intends to teach the students climatic design aspects and passive control process through multiple design exercises.

COURSE OBJECTIVES
- To provide the knowledge of climate-responsive design and its application on architecture.
- To introduce the students with passive climatic controlling devices and methods.
- Applying the knowledge to determine the building orientation with respect to cardinal directions.
- Helping the students to understand context-based design and circulation design.

COURSE CONTENT
Case studies to comprehend the underlying relationship among function, form, space and technology in architecture. Analysis of function in order to formulate architectural program to generate site specific architectural form in three dimensions. Understanding of basic concepts of architectural forms and identification of spaces in term of exterior-interior; served-service; activity-circulation etc. Report writing based on literature survey and field studies. Design of buildings with simple functions. Emphasis will be given in how to address climate through design process. To understand and design building circulation by path-space relationship.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Develop the knowledge of site contexts and orientation with built-form and site planning
CO 2	explain energy-efficiency in environmentally integrated buildings and their properties
CO 3	apply passive heating and cooling, natural lighting and air ventilation inside the building
CO 4	articulate the façade design to achieve maximum comfort
CO 5	design circulation system for facilities buildings

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3							
CO 2		3						3	
CO 3	2	3						3	
CO 4	2	3							
CO 5	2	3							

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Project, case study, workshop	Group Presentation, Summative assessment
CO2	Project, case study, workshop	Group Presentation, Summative assessment
CO3	Project, self-learning	Continuous assessment, Summative assessment
CO4	Project, self-learning	Continuous assessment, Summative assessment
CO5	Project, field demonstration	Continuous assessment, Summative assessment

Books Recommended

1. **Joseph De Chiara:** Time Saver Standards for Building Types
2. **Quentin Pickard (ed):** The Architects Handbook
3. **O. H. Koenigsberger et al**: Manual of Tropical Housing and Building-Climate Design
4. **M.A. Muktadir**: Designing Building in the Tropics

Year/ Semester	**2nd Year 2nd Semester**		
Course Title	**ED III: Visual and Sonic Environment**		
Course Code	ARC 0712 2241	**Stream**	4
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

Light is an essential element of the environment to improve the visual experience and comfort. Studying the visual environment will increase the skill of students to admit natural lights and control unpleasant lighting in designed spaces. Acoustics in designed spaces is important to ensure an effective working environment. Studies on sound isolation, absorption, speech privacy and sound reinforcement will develop the capacity of students to design spaces with special attention to a comfortable sonic environment.

COURSE CONTENT:

Visual: Physical properties of the visual environment. Human responses to environmental vision factors. Non-visual effects of light - health and well-being. Natural light in buildings – sunlight, daylight and reflected light. Strategies for sidelighting, toplighting and atria. Prediction tools and techniques of supplementary and artificial lighting. Designing for daylight in the tropics. Lighting distribution strategies and indoor space quality. Lighting applications for office, museum, library and residential buildings.

Sonic: The concepts and problems related to architectural acoustics. Physical and biological properties of sound. The fundamentals of sound perception, absorption and isolation. The concept of noise and noise control. Criteria for noise control design and acoustical measurements. Principles of the acoustic design of rooms for lecture, music and multi-purpose use. Behaviour of sound in enCOsed spaces. Speech privacy:open plan office, white noise, and background noise. Standards and codes: evaluation of acoustical performance.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	develop strategies to improve spatial quality with natural light
CO 2	Apply controlled light in an indoor environment for visual comfort.
CO 3	design artificial indoor lighting for different tasks.
CO 4	design spaces with special attention to control sound through sound insulation and isolation of spaces with different sound levels.
CO 5	redirect, reinforce or distribute sound through architectural elements.

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONAL SKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3							
CO 2	2							3	
CO 3		2				3			
CO 4	2	3				2			
CO 5		2						3	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-Learning Strategy	Assessment strategy
CO1	Lecture	Midterm Examination 1, Semester-end Examination
CO2	Lecture, Documentaries	Midterm Examination 1, Semester-end Examination
CO3	Seminar /Tutorial, Guest Lectures, Field visit	Midterm Examination 2, Presentation (Individual/group), Semester-end Examination
CO4	Lecture, Workshop	Midterm Examination 2, Presentation (Individual/group) Semester-end Examination
CO5	Lecture	Midterm Examination 2, Semester-end Examination

Books Recommended

8. Egan, M. David and Olgyay, W. Victor (1983)**.** ***Architectural lighting*****.** McGraw Hill: New York, USA
9. Lechner, Norbert (2015). ***Heating, Cooling, Lighting: Sustainable Design Methods for Architects***. John Wiley & Sons, Inc.: New Jersey, USA
10. Egan, M. David (1988)**.** ***Architectural acoustics*****.** McGraw Hill: New York, USA
11. Lechner, Norbert (2012). ***Plumbing, Electricity, Acoustics: Sustainable Design Methods for Architects***. John Wiley & Sons, Inc.: New Jersey, USA
12. Koenigsberger, O. H. et al. (1973). ***Climatic Design: Manual of tropical housing and building***. Orient Longman Private Limited: Chennai, India

Year/ Semester	**2nd Year 2nd Semester**		
Course Title	**Construction Methods and Materials**		
Course Code	ARC 0732 2261	**Stream**	6
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

The course aims to study the properties of traditional and contemporary building and finish material, their selection criteria and use of construction as well as their response to specific environment. This course is also designed for the introduction of basic principles of building construction, understanding the behavior of various components of buildings, general details of several types of construction system.

COURSE OBJECTIVES:

- To facilitate necessary knowledge about the properties, characteristics, strength, manufacture, processing and application of materials.
- Make the students understand the advantages and limitations of material according to types of building.
- To expose the students to the construction methods of several components of a structure such as foundation, brick work, floor, stair, door and windows etc.
- To enable the students to learn detailing of both structural and finishing works of a construction.
- Getting idea about the behavior of different elements of construction systems in relation to properties of materials.
- To make students familiar with detailed illustrations and specifications related to construction details and techniques.

COURSE CONTENT:

Construction materials: Introduction to different types of building and finish materials. Classification, properties, manufacturing, preparation, usage, application and different technical aspects of brick, cement, sand, mortar and plaster, concrete, steel, timber, etc. Classification of different types to finish materials. Selection, properties, preparation, application and maintenance of glass, plastic, tiles, roofing insulation, white/ color washing, paints, varnishes, distempers etc.

Construction methods: Introduction to construction surveying and layout- principles and techniques of physical surveys. Chain survey, traverse survey, plane table survey, levels and levelling, etc. Foundations, methods of determining bearing capacity of soil, types of foundations, their methods and techniques of construction. Brick masonry works, different types of brick bond and their procedure, Partition walls and cavity walls, Damp proofing and water proofing, their method and treatment. Lintels and arches, their construction technique. Stairs- classification depending on geometry and material, technical aspects and construction technique of different stairs. Door-window and their classification. Types of floors and their construction method. Carpentry joints, Classification and construction technique of roof. Plastering and pointing system.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	develop practical and advanced construction knowledge required to begin professional career in architectural practice and related fields
CO 2	recognize different types of construction methods of building components, different structural systems, conditions for the stability of a structure, application methods of different type of protective components and finish materials
CO 3	Compare the quality assurance measures and testing procedures related to material, workmanship and performance for the specific topic
CO 4	Apply the knowledge of context-based modern technology in construction, which can be helpful for architectural-technology based further research
CO 5	identify the format and procedures to prepare working drawings for building construction work

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs:

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3						3	
CO 2	2	2						3	
CO 3	2							3	
CO 4		2	3					3	
CO 5	2							3	2

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture, digital presentation	Semester-end examination
CO2	Lecture, digital presentation	Mid-term examination 1, Semester-end examination
CO3	Lecture, digital presentation, Self-learning	Class evaluation, Mid-term examination 1, Semester-end examination
CO4	Lecture, digital presentation	Mid-term examination 2, Semester-end examination

CO5	Lecture, digital presentation	Mid-term examination 2, Class evaluation, Semester-end examination

Books Recommended

1. **Aziz, M. A**.: Engineering Materials
2. **Sushil Kumar**: Building Construction.
3. **Smith, R. C.:** Materials of Construction
4. **Anders, C. K.:** Manufactures Manuals and Brochures
5. **Francis D. K. Ching**: Building Construction Illustrated, Wiley (2014)

Year/ Semester	**2nd Year 2nd Semester**		
Course Title	**Structure II - Mechanics of Solids**		
Course Code	CEE 0732 2211A	**Stream**	1
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

This course will develop basic knowledge and use the relevant physical properties and fundamental laws governing materials and structures' behavior. Students will learn how to solve various problems of interest in Structural Analysis. In this course, the emphasis is on the physical understanding of mechanisms underlying materials' mechanical and structural behavior.

COURSE OBJECTIVES

- To understand the concept of stress and strain in the members subjected to tension and compression force
- Help students conceptualize solid mechanics' fundamental theories to calculate forces, deflections, moments, stresses, and strains in engineering structures
- To introduce the shear force and bending moment diagrams to properly analyze statically determinate beams and frames
- To make them able to analyze indeterminate beam and buckling of columns

COURSE CONTENT

Fundamental concepts of stress and strain:

This chapter presents a review of the fundamental concepts of stress and strain. A brief discussion on axial stress, axial strain, shearing stress, shearing strain, and bearing stress, bearing strain. Stress calculation of thin-walled pressure vessels.

Mechanical properties of materials:

This chapter deals with analyzing mechanical properties of materials, stress-strain diagram, Hook's law for axial and shearing deformation, and Poisson's ratio. Calculate the stress and strain of different members: Calculate stresses and strains in members subjected to tension, compression, shear, and temperature changes. Calculate stresses and strains of statically indeterminate members.

Flexural and shearing stresses in beams; Principal stresses:

Introduction, Derivation of flexure formula, Economic section, Shearing stress at a loaded beam, Distribution of shearing stress, principal stress and strain.

Shear force and bending moment diagrams for statically determinate beams and frames:

Definition, determination of Shear force and bending moment for determinate beams and frames, Relation among load, shear and moment, Shear force, and bending moment diagram.

Buckling of columns:

Introduction, Types of end conditions of the column, Euler's formula to columns with different end conditions, Rankine's formula for long columns, and effect of eccentric loading on the Rankine's and Euler's formula for long columns are also discussed here.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Apply the theory of solid mechanics to analyze a wide variety of structural members subjected to tension, compression, shear, and temperature changes to solve real world problems
CO 2	Apply the concepts and methodologies of materials' mechanical properties to solve practical problems related to civil engineering structures
CO 3	Present graphical variation of shear force and bending moment diagrams along the member's axis could be shown.

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2				2	3		3	
CO 2	2				2	3		3	
CO 3	2				2	3		3	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture with projector, Problem-based Learning	Mid-term examination 1, Semester-end examination
CO2	Lecture with projector, Problem-based Learning	Mid-term examination 1, Semester-end examination
CO3	Lecture with projector, Self-learning, Problem-based Learning	Class evaluation, Mid-term examination 2, Semester-end examination

Books Recommended

1. Pytel, A. and Singer, F.L. (1987), Strength of materials. Harper and Row, publishers, Inc. ISBN 0-0604531343
2. Popov, E.P. and Balan, T.A. (1998), Engineering mechanics of solids. Pearson Education, Inc. ISBN 81-7808-535-6
3. Khurmi, R.S. (1968), Strength of materials. S. Chad and Company Ltd. ISBN 81-219-2822-2
4. Beer, F.P., Johnston, E.R., Dewolf, J.T. and Mazurek, D.F. (2012) Mechanics of materials. McGraw-Hill Companies, Inc. ISBN 978-0-07-338028-5
5. Hibbler, R.C. (2012) Structural Analysis. Pearson Prentice Hall. ISBN-13: 978-0-13-257053-4

Year/ Semester	2nd Year 2nd Semester		
Course Title	Philosophy		
Course Code	ARC 0213 2271	Stream	7
No. of Credits	2.0	Course Hour	2.0 hours/week

COURSE RATIONALE:
Different socio-political era of human civilization. Students are able to know the basic constituents of philosophy and the thought process of philosophers. Students will able to realize, recognize and compare the trends and traits of iconic philosophical thoughts of the world.

COURSE CONTENT:
Introduction to philosophy, definition of philosophy, purpose of philosophy. Fundamental of philosophy; Nature of philosophical enquiry; Relationship of philosophy to science, history, politics, religion and especially to architecture.
Historical overview of Ancient, Medieval and Modern philosophy, both Oriental and Occidental. From Socrates to Sartre and beyond.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Explain various notions, attributes of basic terms and definition of philosophy
CO 2	Develop the knowledge with the geo-political context and philosophical thoughts of different human civilizations
CO 3	Compare the various school of thoughts, from east to west, from ancient to modern era
CO 4	Apply the Philosophy to concept generation in Architecture

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2			3					
CO 2				3	2	3			
CO 3					2	3			
CO4		2			3				2

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	assessment, Mid-term examination 1, Semester-end examination
CO2	Lecture	assessment, Mid-term examination 1, Semester-end examination
CO3	Lecture	assessment, Mid-term examination 2, Semester-end examination
CO4	Lecture	Quiz, Semester-end examination

Books Recommended

1. **Carson D. (1999)**; *Fotografiks*; Gingko Pr. Inc., NY.
2. **Lenman R.(2008)**; *The Oxford Companion to the Photograph*; Oxford University Press, UK.
3. **NGS US (2011)**; *National Geographic – Complete Photography*; NGS, US.

Year/ Semester	2nd Year 2nd Semester		
Course Title	Introduction to Programming With Python (Lab)		
Course Code	CSE 0613 2214A	Stream	1
No. of Credits	2.0	Course Hour	4.0 hours/week

COURSE RATIONALE:
In this current world, most of the research works require computational data analysis of corresponding fields. This requirement has emphasized the necessity of a knowledge of computer programming for all the researchers. For research-related purposes, computer programming using Python is one of the best choices. This course is designed with the purpose to make students acquainted with programming using python and make them comfortable to deal with computational data analysis.

COURSE OBJECTIVES:
- Help them conceptualize basic theories of computer programming
- Make the students understand fundamental components of python programming
- To develop skills for writing computer programs using all necessary branches of Python
- Accumulate basic ideas about data structures and data manipulations

COURSE CONTENT:
Laboratory works based on theory classes and basic problem solving from rosalind.info using Pycharm, Jupyter, and Anaconda IDEs.
Computer Basics: Concept on Computer Hardware, Software and its classification, Compiler vs Interpreter. **Using the Python Interpreter:** Invoking the Interpreter, Argument Passing, Interactive Mode, The Interpreter, and Its Environment, Source Code Encoding; **An Informal Introduction to Python:** Using Python as a Calculator- Numbers, Strings, Lists. First Steps Towards Programming; **More Control Flow Tools:** if Statements, for Statements, The range() Function, break and continue Statements, and else Clauses on Loops, pass Statements, Defining Functions; **More on Defining Functions:** Default Argument Values, Keyword Arguments, Arbitrary Argument Lists, Unpacking Argument Lists, Lambda Expressions, Documentation Strings, Function Annotations, **Intermezzo:** Coding Style; **Data Structures:** More on Lists- Using Lists as Stacks, Using Lists as Queues, List Comprehensions, Nested List Comprehensions, The del statement, Tuples and Sequences, Sets, Dictionaries, Looping Techniques, More on Conditions, Comparing Sequences and Other Types; **Modules:** More on Modules- Executing

modules as scripts, The Module Search Path, Compiled" Python files, Standard Modules, The dir() Function, Packages- Importing * From a Package, Intra-package References, Packages in Multiple Directories, matplotlib, numpy, other common necessary packages; **Input and Output:** Fancier Output Formatting, Old string formatting, **Reading and Writing Files**: Methods of File Objects, Saving structured data with JSON; **Errors and Exceptions:** Syntax Errors, Exceptions, Handling Exceptions, Raising Exceptions, User-defined Exceptions, Defining Clean-up Actions, Predefined Clean-up Actions. **Classes:** A Word About Names and Objects, Python Scopes and Namespaces, Scopes and Namespaces Example, A First Look at Classes, Class Definition Syntax, Class Objects, Instance Objects, Method Objects, Class and Instance Variables, Random Remarks, Inheritance, Multiple Inheritance, Private Variables, Odds and Ends, Iterators, Generators, Generator Expressions.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Design solutions of real-life problems using necessary components of Python
CO 2	Identify errors from a program and use exception handlers to handle errors and exceptions
CO 3	Implement Object Oriented Programming and modular concepts
CO 4	Design basic data structures to solve efficient data storage issues
CO 5	Apply knowledge of programming in data analysis and manipulation

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1		2						2	
CO 2						2			
CO 3		2				2			
CO 4						2			
CO 5						2			

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-Learning Strategy	Assessment strategy
CO1	Class Lectures, Textbook, Online Resources, Group Discussion	Assignment, Lab Examination
CO2	Class Lectures, Textbook, Online Resources, Group Discussion, Problem-based Learning, Project-based Learning	Assignment, Lab Examination, Programming Problems
CO3	Class Lectures, Textbook, Online Resources, Problem-based Learning, Project-based Learning	Assignment, Programming Problems, Projects
CO4	Group Discussion, Problem-based Learning, Project-based Learning, Blended Learning	Viva-voce, Presentation, Report Writing, Projects
CO5	Group Discussion, Problem-based Learning, Project-based Learning, Blended Learning	Viva-voce, Presentation, Report Writing, Projects

Books Recommended

1. Learning Python, By Mark Lutz, 5thEdition
2. Think Python, By Allen B. Downey
3. The Python Tutorial, Official documentation of Python

Year/ Semester	**2nd Year 2nd Semester**		
Course Title	**Principles of Sociology**		
Course Code	SOC 0314 2213A	**Stream**	1
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

The course is organized to provide students from the ARC department with the fundamentals of sociological knowledge. It intends to teach students core but basic topics of sociology including theories and methods, culture, society, social organization, social stratification, and social change. Above all, it provides students from the IPE with the skills to understand society's basic ideas and concepts from sociological points of view.

COURSE OBJECTIVES

- Teach students basic sociological concepts including society, community, social process, culture, and social structure.
- Provide students with knowledge of the major theoretical approaches and methods in sociology.
- Help students gain knowledge on social institutions of human society including the family, marriage, kinship, and religion.
- Help students develop insight to address crime, deviance, and social control.
- Provide students with basic knowledge on global environmental issues and population

COURSE CONTENT

Introduction to Sociology: Definition, Nature, Scope, Origin & Development of Sociology

Doing Sociology: Scientific Method &Techniques for Sociological Investigation

Basic Concepts and Social Processes: Society, Community, Association, Institution, Group, Cooperation, Conformity, Competition, Conflict, Assimilation, and Accommodation

Culture: Development of culture, components of culture, Cultural integration, Cultural variation, Culture, and sociological perspectives

Types of Society: From Hunting Gathering to Industrialization.

Social Institutions: Family, Religion, Perspectives.
Social Stratification: Systems & Perspectives, Social Mobility, Class Structure.
Social Change: Factors & Theories.
Collective Movement: Group, Crowd & Mob.
Population & Environment: Population Growth, Ecology, Ecosystem, Threats to Global Environment

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Demonstrate an understanding of key sociological concepts and theories of reality;
CO 2	Explain primary ideas and methods of sociological research;
CO 3	Analyze social stratification, systems, and different forms of social inequality;
CO 4	Draw connections between society and different environmental issues; and
CO 5	Apply sociological concepts and theories in analyzing real social lives.

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1		2				2			
CO 2					2	2			
CO 3		2				3			
CO 4					2	3			
CO 5		2				3			

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture and Visual Presentation	Mid-term examination 1, Semester-end examination
CO2	Lecture and Class Discussion	Mid-term examination 1, Semester-end examination
CO3	Lecture, Visual Presentation, and Class Discussion	Quiz, Semester-end examination
CO4	Lecture, Visual Presentation, and Group Discussion	Mid-term examination 2, Semester-end examination
CO5	Lecture, Visual Presentation, and Class Presentation.	Mid-term examination 2, Semester-end examination

Books Recommended

1. Bottomore, T. B. (1964). Sociology: A Guide to Problems and Literature. London: George Allen & Unwin, Ltd.
2. Henslin, J. M. (2004). Sociology: a down-to-earth approach (3rd ed.). NSW: Pearson Australia.
3. Giddens, A. (2009). Sociology (6th ed.). Cambridge: Polity Press.
4. Inkles, A. (1964). What Is Sociology? an Introduction to the Discipline and Profession (7th ed.). Denvor: Prentice Hall.
5. MacIver, R. M., & Page, C. H. (1965) Society. London: Macmillan and Company, London
6. Robertson, I. (1997). Sociology: A Brief Introduction. New York: Worth Publishers, Inc.
7. Schaefer, R. T., & R.P. Lamm, R. P. (1997). Sociology: A Brief Introduction (2nd ed). New York: McGraw Hill.
8. Zanden, J. W. V. (1995). Sociology: The Core (4th ed). New York. NY: McGraw-Hill College.

Year/ Semester	**2nd Year 2nd Semester**		
Course Title	**Principles of Economics**		
Course Code	ECO 0311 2215A	**Stream**	01
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

This ECO105A course provides an introduction to the main ideas and concepts involved in modern economics and attempts to provide students with an understanding of how the economy works, what type of problems economists attempt to solve, and how they set about trying to solve them. The course is primarily concerned with the analysis of individual decision-making agents, the behaviour of firms and industries in the economy (microeconomics), on the economy as a whole (macroeconomics) and the inherent problems facing underdeveloped and developing countries (economic development).

COURSE OBJECTIVES

- Helping the students to understand economics as a forceful factor of architectural development.
- To provide an introduction to macroeconomic analysis outlining how the national income is measured and determined.
- To provide students with an understanding of economic theories and analysis in the field of development economics.
- To provide the knowledge of the impact of GDP, growth and development, socio-economic development on building industry in Bangladesh.

COURSE CONTENT

ExPOring Subject Matter of Economics: Economics – Definition and Scope; understanding economic principles; economic resources-allocation and distribution problems; economic models-circular flow diagram and production possibilities frontier, concept of opportunity cost.
Introduction to Macroeconomics: Key macroeconomic indicators and their performance measurement - GNP, GDP, inflation, unemPOyment.
Money and banking: functions of money, function of commercial and central bank, monetary policy; fiscal policy and structure of govt. budget.
Development and related issues: Growth and development; concept of poverty and poverty measures; HDI; key human-socio-economic development indicators of Bangladesh, Sustainable Development Goals (SDG).

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Explain the analysis of individual decision-making agents, the behaviour of firms and industries in the economy
CO 2	Explain the concept of elasticity quantitatively and qualitatively in economic analysis and differentiate between different types of markets
CO 3	Explain macroeconomic concepts and use simple economic models to interpret the behaviour of key macroeconomic variables
CO 4	Explain monetary and fiscal policy and Government budget
CO 5	Confront the underdeveloped and developing countries

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2		3						
CO 2								2	
CO 3			3						
CO 4			3						
CO 5			3					2	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	Mid-term examination 1, Semester-end examination
CO2	Lecture, Self-learning	Assignment, Semester-end examination
CO3	Lecture	Mid-term examination 2, Semester-end examination
CO4	Lecture	Assignment, Semester-end examination
CO5	Lecture	Presentation, Semester-end examination

Books Recommended

1. **Arnold, R. A**. (2014): Economics, South Western Publishing Company, Eleventh Edition
2. Bangladesh Economic Review relevant issues.
3. Mankiw, N. G. (2012): Principles of Economics, Thomson South Western Publishing, Sixth Edition
4. Samuelson, P. A. and Nordhaus,W. D. (2009): Economics, McGraw-Hill USA, Nineteenth Edition.
5. Todaro, M. P. and Smith,S. C. (2012): Economics of Development in the Third World, Longman, Eleventh Edition

Year/ Semester	**3rd Year 1st Semester**		
Course Title	**Introduction to Spatial Planning**		
Course Code	ARC 0731 3181	**Stream**	8
No. of Credits	2.0	**Course Hour**	2.0 hours/week

1.

2. COURSE RATIONALE:

3. The course aims to introduce the theory, concept and practices in physical planning through review and examination of city structures since the beginning of the earliest human settlements to the contemporary

4.

5. COURSE CONTENT:

6. Definition and scope of planning, types of spatial planning. A short history of planning: Origin and evolution of settlements and cities, new thoughts and ideas in planning after the industrial revolution. The spatial structure of cities: concentric zone theory, sector theory, multiple nuclei theory. Planning Governance: Legislation framework, tools, instruments. Spatial planning methods: Preplanning, planning and implementation. Theories of zoning. Stakeholder engagement.

7.

8. Planning culture of Bangladesh; History of town planning in Bangladesh; Urban planning system and local level planning; Planning law and governance; Problem and issues of land management system in Bangladesh. Concept of contemporary planning tools and process: Community Planning, Public-Private Partnership, Built Operate Transfer, Transit-Oriented Development.

9.

10. COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	distinguish various human settlements and identify their planning process
CO 2	Explain various socio-cultural, political, environmental and technological impacts to the growth of the cities throughout the globe
CO 3	Apply concepts in urban history and theory through both verbal and written presentations
CO 4	identify the limitations of planning and land management system in Bangladesh
CO 5	apply critical thinking in a range of corresponding fields of history and theory in architecture and urban planning

11.

12. **MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs:**

13.

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	2							
CO 2		2				3			
CO 3		2							3
CO 4	2	2		3					
CO 5		2				3		3	

14.

15. **MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:**

16.

	Teaching -Learning Strategy	**Assessment strategy**
CO1	Lecture with projector	Mid-term examination 1, Semester-end examination
CO2	Lecture with projector	Mid-term examination 1, Semester-end examination
CO3	Lecture with projector	Class evaluation, Mid-term examination 2, Semester-end examination
CO4	Lecture with projector	Mid-term examination 2, Semester-end examination
CO5	Lecture with projector	Assignment, Mid-term examination 2, Semester-end examination

17.

18. Books Recommended

19. Bardo, J.W. and Hartman, J.J., 1982: Urban Sociology – A Systematic Introduction, F.E. Peacock Publishers, Inc., New York

20. Bourne, L.S. (ed.), 1971: Internal Structure of the City – Readings on Space and Environment, Oxford University Press, Inc., New York

21. Carter, H., 1975: The Study of Urban Geography, Edward Arnold Ltd., London

22. Doxiadis, C.A., 1968: Ekistics – An Introduction to the Science of Human Settlements, Hutchinson and Co. (Publishers) Ltd., London

23. Elahi, K.M. and Rumi, S.R.A. (eds.), 2005: Nogor Bhugol – Shamprotik Dhara, Delta Books, Dhaka

24. Gallion, A.B. and Eisner, S., 2000: The Urban Pattern – City Planning and Design, CBS Publishers and Distributors, New Delhi

25. Hall, P., 1992: Urban and Regional Planning (third edition), Routledge, London

26. Rahman, G., 2008: Town Planning and the Political Culture of Bangladesh, A.H. Development Publishing House, Dhaka

27. Sultana, S., 1993: Rural Settlements in Bangladesh – Spatial Pattern and Development, Graphosman, Dhaka

Year/ Semester	**3rd Year 1st Semester**		
Course Title	**Design Studio V**		
Course Code	ARC 0731 3132	**Stream**	3
No. of Credits	6.0	**Course Hour**	12.0 hours/week

COURSE RATIONALE:

Students will study, understand and prepare presentations on different structural systems with relevant case studies. Students will also study and prepare reports on the fundamental services in a building such as mechanical, plumbing, and electrical installations.

This studio course will exercise students on exploring the detailed characteristics of different kinds of structural systems, such as post-lintel, post-slab, wall-slab, etc. in building design. The studio course will also emphasize on multi-functional integrated design approach including considerations of structural systems with detail construction and techniques.

COURSE CONTENT:

The principles and process behind generating architectural forms. Understanding the relationship of form and space to accentuate experiential qualities in architecture. Introduction of the basic relationship between structural logic and formal expression. Influence of technology in function, form, and space. Design exercises will focus on understanding the structural components of a building.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Implement architectural design process with different structural systems
CO 2	Develop a proper structural system for different building types (residential, commercial, mixed-use, multistoried, factory, etc.)
CO 3	demonstrate and explain structural understanding through visual presentation (graphical and physical model making)

CO 4	design building service systems for facilities buildings (electrical, mechanical, plumbing, etc.)
CO 5	Generate or formulate an economical and rational design for low- and high-density complex buildings.

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	2				3			
CO 2		2				3		3	
CO 3		2							3
CO 4		2			3			3	
CO 5		2	3			3		3	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-Learning Strategy	Assessment strategy
CO1	Assignment, research, case-study	Assignment, Summative Assessment
CO2	Project, Case-study	Assignment, Presentation (Individual/Group), Summative Assessment
CO3	Project, field visit	Presentation (Individual/Group), Summative Assessment
CO4	Assignment, research, case-study	Assignment, Summative Assessment
CO5	Project	Continuous Assessment, Individual Presentation, Summative Assessment

Books Recommended

1) **Angus J. Macdonald;** Structure and Architecture
2) **Mario G. Salvadori;** Structure in Architecture: The Building of Buildings
3) **Francis D.K.Ching;** Building Structures Illustrated: Patterns, Systems, and Design.
4) **Andrew Charleson:** Structure as Architecture: A Source Book for Architects and Structural Engineers
5) **J. E. Gordon:** Structures: Or Why Things Don't Fall Down
6) **Sigrid Adriaenssens and Philippe Block:** Shell Structures for Architecture: Form Finding and Optimization
7) **Asterios Agkathidis:** Biomorphic Structures:Architecture Inspired by Nature

Year/ Semester	**3rd Year 1st Semester**		
Course Title	**Working drawing**		
Course Code	ARC 0732 3152	**Stream**	5
No. of Credits	2.0	**Course Hour**	4.0 hours/week

COURSE RATIONALE

This course will ensure students to make ready the necessary detail drawings for civil construction of a building.

COURSE OBJECTIVES

- To motivate and to prepare students more careful about building design.
- To make students capable to know the detail treatment of a building.
- To inspire student to design in a module for better spatial, structural, material-based design.
- To make students capable to prepare all necessary detail and easily readable drawing for civil construction works of a building.
- To be able to read structural, electrical, plumbing and fire safety drawings.
- To develop a complete book containing civil construction drawing.

COURSE CONTENT

Design and drawings specifying materials and instructions for construction, Understanding construction process and techniques. The construction drawing will include preparation of working and detail drawings of all building components. Details of drainage, plumbing features, damp-proofing and insulation. Bathroom and kitchen layouts. Application of building codes and by-laws.

Design and drawings specifying materials and instructions to manufacturers of building elements, components, fittings and fixtures which are industrially produced understanding manufacturing process to generate creative design. The production drawing will include designing with variety of materials and manufacturing process of a range of building components like door, window, fitting and fixture of functional and decorative nature.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	create a professional architectural presentation drawing
CO 2	Draw detail architectural working, structural, electrical, plumbing and fire safety drawings, as-built drawings of building projects
CO 3	Illustrate the detail architectural working drawing for civil construction
CO 4	formulate a module for working to reduce construction cost
CO 5	Illustrate complete working drawing books in a practical and professional manner

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2								3
CO 2	2	2			3				
CO 3	2				3				3
CO 4	2		3						
CO 5	2						2		3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-Learning Strategy	Assessment strategy
CO1	Case-study, Project	Assignment, Summative Assessment
CO2	Case-study, field visit	Assignment, Presentation (Individual/Group), Summative Assessment
CO3	Project, field visit	Presentation (Individual/Group), Summative Assessment
CO4	Project	Continuous Assessment, Summative Assessment
CO5	Project	Continuous Assessment, Summative Assessment

Books Recommended

1. **Ralph W. Liebing**: Architectural Working Drawings
2. **Annette Spiro (Ed) & David Ganzoni (Ed):** The Working Drawing: The Architect's Tool
3. **Ralph W. Liebing**: Handbook of Detailing: The Graphic Anatomy of Construction

Year/ Semester	**3rd Year 1st Semester**		
Course Title	**Structure III – Building Structures I**		
Course Code	CEE 0732 3111A	**Stream**	1
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

T This course familiarizes students to the vertical load calculation for the components of a frame building. It also introduces students with the fundamental design process of RCC structures. Students will get familiar to the configurations of building forms vulnerable to earthquake and introduced to earthquake resistant building systems.

COURSE OBJECTIVES

- To introduce the vertical load calculation for the components of a building.
- Acquaint approximate analysis of multistoried buildings for vertical and lateral loads.
- To make familiar with the knowledge of earthquake resistant building.

COURSE CONTENT

Slopes and deflections in statically determinate beams:
Introduction, double integration method, theorem of area moment method, conjugate beam method.

Indeterminate beam analyses:
Introduction to statically indeterminate structure, Analysis of statically indeterminate beam using moment area and conjugate beam method.

Vertical load calculation for the components of a building:
Calculation of the load of wall, slab, beam, column, live load.

Approximate analysis of multistoried buildings for vertical and lateral loads:
Portal method and cantilever method.

Earthquake resistant structural systems:
Horizontal and vertical irregularities of buildings (soft story, weak story, torsional irregularity, etc.).
Base isolation, damping, bracing, and other measures for structural stability.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Analyze horizontal and vertical loads on building
CO 2	Identify the load of different components of building
CO 3	Perceive, design and analyze RCC beam and slab
CO 4	Conceptualize the earthquake resistant design features of a building.

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2					3		2	
CO 2	2					3		2	
CO 3	2					3		2	
CO 4	2					3		2	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture, Text book, Problem-based learning	Mid-term examination 1, Semester-end examination
CO2	Lecture, Text book	Mid-term examination 1, Semester-end examination
CO3	Lecture, Text book, Problem-based learning	Mid-term examination 2, Semester-end examination
CO4	Lecture, Text book, Problem-based learning	Mid-term examination 2, Class evaluation, Semester-end examination

Books Recommended

1) Khurmi, R. S. (2013), Strength of Material. S. Chand ltd. ISBN-13: 978-81-219-0533-6
2) Pytel A., and Singer F. L. (1987), Strength of Materials. 4th Ed., Harpercollins College Div. ISBN-13: 978-0-06-045313-8
3) Arthur H. Nilson, David Darwin, Charles W. Dolan (2010), Design of Concrete Structures.14th Ed., McGraw Hill. ISBN–007-123260-5
4) George Winter, Leonard Church, Charles Edward O'Rourke, Arthur H. Nilson (1964), Design of Concrete Structures. 7th Ed., McGraw Hill. ISBN–007-123260-5

5) M. Nadim Hassoun, Akthem Al- Manaseer (2008), Structural Concrete. 4th Ed., John Wiley and Sons, Inc. ISBN– 978-0-470-17094-6.
6) Housing and Building Research Institute, Bangladesh (2006), Bangladesh National Building Code (BNBC- 2006)
7) American Concrete Institute, ACI Codes, 2003

Year/ Semester	**3rd Year 1st Semester**		
Course Title	**Building Services I- Mechanical**		
Course Code	MEE0715 3113A	**Stream**	1
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

The intent of the subject is to make the students learn about the advanced mechanical services with special reference to lighting and acoustics.

COURSE OBJECTIVES

- To understand the basic concept of thermodynamics so that students are able to understand psychrometry and air conditioning systems.
- To introduce the fundamental principles and different methods of air conditioning.
- To make student able to apply psychrometric charts in calculating psychrometric properties.
- To make students understand the basic air conditioning processes on psychometric charts, calculate cooling load for its applications in comfort and industrial air conditioning.
- To introduce various equipment-operating principles, operating and safety controls emPOyed in air conditioning systems.
- Getting idea about fire-fighting methods in application of building service.
- To familiarize different vertical transportation system emPOyed in building structures.

COURSE CONTENT

Thermodynamics, Introduction: Definition and applications of thermodynamics, Basic concept and definition: Systems and control volume, state and equilibrium, process and cycles, thermodynamic properties, forms of energies, Laws of thermodynamics.
Psychrometry: Definition, psychrometric properties, psychrometric chart, and its application.
Air-conditioning: importance application of air-conditioning, air-conditioning systems, basic refrigeration cycle: Basic concept, vapor compression cycle for air-conditioning, air-conditioning equipment, cooling load calculation;
Duct system design: Concept, importance and objectives of duct system design, air handling and distribution, different types of supply and return duct systems, duct design methods;
Fire hazards, fire- tetrahedron, different classes of fire and corresponding extinguishers, sprinkler system.
Vertical Transportation: Types of elevators, Determination of size and quality of elevators, Incoming and outgoing traffic handling, Escalators and moving ramps.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Explain fundamental laws and concepts of thermodynamics,
CO 2	Design duct systems for the application of air handling in building systems.
CO 3	Calculate cooling load for air conditioning systems used for various condition.
CO 4	Explain different vertical transport systems for the application in building service.
CO 5	Design fire-fighting system in multi-storied buildings

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2				2			3	
CO 2	2				2			3	
CO 3	2				2			3	
CO 4	2				2			3	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture, Text book	Mid-term examination 1, Semester-end examination
CO2	Lecture, Text book, Problem-based learning	Mid-term examination 1, Semester-end examination
CO3	Lecture, Text book, Problem-based learning	Mid-term examination 2, Semester-end examination
CO4	Lecture, Text book, Project-based learning	Mid-term examination 2, Class evaluation, Semester-end examination

Books Recommended

1) Grondzik, Kwok, Stein and Reynolds. *Mechanical and Electrical Equipment for Buildings* 11th Edition (Basic Books. 2009)
2) Hundy, Trott & Welch (2008), *Refrigeration & Air-conditioning*, Butterworth-Heinemann
3) Ameen (2006), *Refrigeration & Air-conditioning*, Prentice Hall

Year/ Semester	**3rd Year 1st Semester**		
Course Title	**DT IV: Facilities Planning and Design**		
Course Code	ARC 0731 3171	**Stream**	7
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

This course intends to inculcate in the students the fundamental design principles and planning process of various facilities planning and design.

COURSE OBJECTIVES:

- Make the students to understand the planning process of different facilities.
- Helping the students to acquire rudimentary knowledge on programming, planning and designing of facilities.
- To develop skills to analyze and compare multidisciplinary approaches related to facilities planning.

COURSE CONTENT:

Approaches to facilities planning and design. Philosophy, policies, objectives, hierarchy and process of facilities planning from different perspectives. Site-planning design. Fundamentals of programming, planning and design of different facilities for architecture with specialized functions.

Facilities planning and design for educational facilities, health facilities, commercial facilities, industrial facilities and miscellaneous projects.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Distinguish the approaches of facilities planning and their principles
CO 2	identify and compare historical references of facilities planning
CO 3	design different facilities for specialized building types such as healthcare, educational, industrial, commercial, etc.
CO 4	integrate the needs of all stakeholders to optimize the effectiveness of facilities planning process
CO 5	Apply or conduct further multidisciplinary research on facilities design

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs:

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	2							
CO 2	2								
CO 3	2	3				3			
CO 4	2	3			3		3		
CO 5	2		3		3				

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture, Text book	Mid-term examination 1, Semester-end examination
CO2	Lecture, Text book	Mid-term examination 1, Semester-end examination
CO3	Lecture, Problem-based learning	Class evaluation, Mid-term examination 2, Semester-end examination
CO4	Lecture, Self-learning	Mid-term examination 2, Semester-end examination
CO5	Lecture, Self-learning	Assignment, Semester-end

		examination

Books Recommended

1. **Tompkins, White, Bozer, Tanchoco:** Facilities Planning
2. **Garcia Diazy, J. MacGregor Smith:** Facilities planning and Design
3. **Joseph De Chiara:** Time-Saver Standards for Building Types
4. **Ernst Neufert, Peter Neufert:** Neufert Architects' Data
5. **C. Kenneth Tanner and Jeffery A. Lackney**: Educational Facilities Planning: Leadership, Architecture, and Management
6. **Robin Guenther & Gail Vittori**: Sustainable Healthcare Architecture
7. **Jargen Adam**: Industrial Buildings (Design Manuals)
8. **Donald Watson, Michael J. Crosbie**: Time Saver Standards for Architectural Design

Year/ Semester	**3rd Year 1st Semester**		
Course Title	**Culture, Space and Place**		
Course Code	ANP 0314 3115A	**Stream**	1
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

Space and place are closely interlinked. Culture has a vital role in place-making. This course has been designed to introduce graduates to the field of sociocultural anthropology, the study of vibrant human cultures and their relation with the making of the built environment. It presents an alternative approach to look at architecture and other forms of place-making and provides a framework to critically assess historical, social, and cultural significances. Anthropology considers urban design and planning from diverse social and cultural contexts. Urban planning is a crucial form of managing urban populations and spaces. An anthropological approach to urban planning focuses on the gap between envisioned utopias and actual everyday lives in the planned spaces. Thus, anthropological studies of urban planning often document how local populations engage with and rework such urban plans. Therefore, this course aims to expose graduates to some of the core concepts of anthropology like fieldwork, ethnography, and explores the questions that guide sociocultural and anthropological influences on architecture and space.

COURSE OBJECTIVES

- Help students with the necessary knowledge about key concepts in anthropology
- Acquaint graduates with the basic knowledge about culture, place and space
- Acquaint graduates with alternative methods and tools appropriate for design investigation and communication in a culturally sensitive way
- Orient with necessary knowledge on urban design and planning keeping cultural issues in consideration.
- Equip graduates to conduct design exercise based on information collected from the cultural reading of place-making practice inside a society

COURSE CONTENT

Part - A

Introductory Discussion: Key issues such as anthropology and its scope and sub-fields, approaches and perspectives of anthropology, culture, ethnography, urban anthropology.
Major Research Methods &Ethnographic approach: Participant observation, cultural logic, key informant interview, focus group discussions, case study; ethnographic research cycles, steps of ethnographic research.
Anthropology & Architecture: points of similarity, points of difference, towards an architectural anthropology, challenges and fieldwork in between architecture and anthropology.

Part – B
Place and spaces: definition, relation of place and places, place making process, neighborhood, urban settlement.
Urban planning and design: social and cultural context of urban planning and design, historical perceive of urban planning, formation of city, types of cities, factors associated with city planning and designed.
Theories and methods: (Theories of place and space,Foucault on space and power, ethnography and other relevant methods).

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	distinguish alternative methods and tools appropriate for design investigation and communication in a culturally sensitive way
CO 2	apply cultural context in urban planning and design
CO 3	:identity urban place-making process, urban settlement, and urban neighborhood through context analysis, conceptualization, and problem engagement
CO 4	formulate a conscious "think anthropologically" to have a deeper understanding of nature, culture, and architecture
CO 5	explain which socio-cultural-environmental features can contribute to a better architectural design

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs:

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3							
CO 2			3						
CO 3		2	3						
CO 4						3			
CO 5			3						

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture and Visual Presentation	Quiz & Group discussion.
CO2	Lecture, Visual Presentation and Class Discussion	Assignment & Mid-term Examination 1.
CO3	Lecture and Visual Presentation	Quiz, Presentation & Surprise test.
CO4	Lecture, Visual Presentation and Group Discussion	Assignment & Mid-term Examination 2 .
CO5	Lecture and Visual Presentation	Assignment, Quiz & Group discussion.

Books Recommended

1. Ester, GisbertAlemnay (2016) An Architecture by means of Anthropology: Beyond learning the tools of social science.
2. Haviland, William (2006) Cultural Anthropology, Holt, Rinchart and Winston.
3. Jaffe Rivke and KoningAnouk de. (2016). Introducing Urban Anthropology. Routledge
4. Setha M. Low, Denise Lawrence-Züniga (edt.) (2003). Anthropology of Space and Place: Locating Culture.
5. Setha M. Low (2005). Theorizing the City: The New Urban Anthropology Reader.
6. Stender, Marie. (2016). Towards an Architectural Anthropology—What Architects can Learn from Anthropology and vice versa.
7. Victor Buchli. (2013). An Anthropology of Architecture. Berg Publishers.

Year/ Semester	**3rd Year 1st Semester**		
Course Title	**Statistics for Architects**		
Course Code	STA 0542 3117A	**Stream**	1
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE
This course intends to acquire knowledge to analyze applied data.

COURSE OBJECTIVES
- Provide the basic knowledge of statistical tools,
- Equip the students for analyzing the data using the tools of descriptive and inferential statistics.

COURSE CONTENT
Part A: **Statistics:** definition, nature and scope of statistics for architecture. Nature of statistical data. Attributes and variables, population and sample, parameter and statistic, tabulation, frequency distribution, graphical representations
Measures of central tendency: Mean median, mode, geometric mean, weighted mean and truncated mean.
Measures of dispersion: range, standard deviation, variance, coefficient of variation, skewness and kurtosis. Probability distributions: uses, applications and properties of Binomial, Poisson, Normal distribution and standard normal distribution.

Part B: Brief discussion on sampling distributions- $\chi 2$, t and F distributions.

Basic concepts of sampling techniques: simple random sampling, stratified sampling and cluster sampling.

Test of hypothesis: about mean, variance, proportion, confidence intervals for mean, variance, proportions, and sample size determination.

Correlation and Regression: definition, measure, interpretation and significance, simple linear regression model with underlying assumptions.

Elements of Research; Research process, Questionnaire design. Introduction to SPSS (Brief description of data processing, Editing and Analysis)

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Explain basic concepts of statistics and describe various statistical tools;
CO 2	Construct frequency distribution and present data graphically;
CO 3	Compute and interpret different measures of central tendency, location, dispersion, and shape characteristics;
CO 4	Demonstrate a solid understanding of probability, probability distribution, sampling distribution and sampling techniques;
CO 5	Perform test of the hypothesis;

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs:

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2								
CO 2							2		
CO 3									
CO 4	2		3			3			
CO 5			3		3				

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture, Text book	Mid-term examination 1, Semester-end examination
CO2	Lecture, Problem-based learning	Mid-term examination 1, Semester-end examination
CO3	Lecture, Problem-based learning	Class evaluation, Mid-term examination 2, Semester-end examination
CO4	Lecture, Self-learning	Mid-term examination 2, Semester-end examination
CO5	Lecture, Problem-based learning	Assignment, Mid-term examination 2, Semester-end examination

Books Recommended

1. **Mostafa, M. G**., (1989) Methods of Statistics, Karim press and publication, Dhaka,Bangladesh,
2. **Gupta S.C. and Kapoor V.K.,** (2000) Fundamentals of Mathematical Statistics, 10th ed, Sultan Chand and Sons,
3. **Hogg R V & Craig A T**, (1995) Introduction to Mathematical Statistics, 5th Ed, Macmillan, London,
4. **DeCoursey, W J.** (2003) Statistics and Probability for Engineering Applications, Newnes, Elsiver Science (USA),
5. **Landau, S. and Everitt, B.S.** (2004) A handbook of statistical analysis using SPSS, Chapman & Hall/CRC.

Year/ Semester	**3rd Year 2nd Semester**		
Course Title	**Design Studio VI**		
Course Code	ARC 0731 3232	**Stream**	3
No. of Credits	6.0	**Course Hour**	12.0hours/week

COURSE RATIONALE:

Aim of this course is to understand structures and services in the design of a complex building in the urban context with emphasis on integrated design approach to achieve high building performance considering highest usability and aesthetics.

COURSE CONTENT:

Preparing and presenting literature and site survey reports addressing design issues of high-rise building and public building. There will be two projects. Project one will cover designing public buildings with multiple built form and functional complexity. Project two will be designing tall building (skyscraper) with advanced design features. Comprehensive design exercise to understand the underlying complexity of building forms by exPOring the characteristics of materials, structural systems, construction methods, building services and environmental requirements in relation to their creative formal expression. The designs should be aesthetically pleasing, responsive to the surroundings and achieve realistic detailing to make it buildable.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Demonstrate understanding of complex structural systems and fit the functional needs with the building structure
CO 2	Develop complex design ideas through the characteristics of structural systems
CO 3	Develop systems to accommodate complex functions and building safety in multiple built forms and multilayer structure
CO 4	Apply design skills to achieve highest usability, iconic character and response to the city context
CO 5	Utilize structure and building construction to appraise spatial order and architectural expression

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL	SOCIAL SKILL	THINKING SKILL	PERSONALSKILL

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3						3	
CO 2	2	3				3			
CO 3	2	3				3		3	
CO 4	2	3				3		3	
CO 5	2	3						3	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Project, case study, workshop	Continuous assessment, Summative assessment
CO2	Project, case study, self-learning	Continuous assessment, Summative assessment
CO3	Project, case study, self-learning	Continuous assessment, Summative assessment
CO4	Project, case study, self-learning	Continuous assessment, Summative assessment
CO5	Project, case study, self-learning	Continuous assessment, Summative assessment

Books Recommended

1. **De. Chiara & Callender:** Time Saver Standards for Building types
2. **Campi. ETH Zurich:** Skyscrapers
3. **Robert M:** Planning & Design of Airports
4. **Francis D.K.Ching:** Building Structures Illustrated: Patterns, Systems, and Design.
5. **J. E. Gordon:** Structures: Or Why Things Don't Fall Down

Year/ Semester	3rd year 2nd semester		
Course Title	**Urban Design**		
Course Code	ARC 0731 3281	**Stream**	8
No. of Credits	2.0	**Course Hour**	2 hours/week

COURSE RATIONALE:

The course introduces students to theories about how cities and urban space formed. Apart from this, it involves guidelines in order to practice urban design in a local context. Besides, the course offers an approach for architecture students to understand the cities in various scales.

COURSE CONTENT:

Introduction to urban design, its aims and objectives. Global view and Context; Development of urban spaces through history; the structure of cities and the ways they can be changed, Introduction to theories about how cities are formed, and the practice of urban design and development with global examples. Modern concepts in urban design; Elements and domains of urban design; Perception and meaning of urban spaces- scale, form, order and time space relationships.

Principles and techniques of urban design, Analysis of physical pattern, Framework for development, Responsive environment – Connectivity, permeability, variety, legibility, appropriateness, richness and personalization. Introduction of models of urban analysis, contemporary theories of urban design, and strategy implementation.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Explain historical and transnational perspective on shaping of cities, urban forms and urban practices
CO 2	Compare the classical and contemporary theories and practice of urban design
CO 3	Analyze the city elements in order to understand the context and its social, cultural, political and environmental attributes.
CO 4	Apply the urban design methods for practice and research work
CO 5	Develop critical thinking of the relationship between urban design and the larger built environment and consider how urban design might play a role in advancing a sustainable urban future

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2								
CO 2		2							
CO 3						3			
CO 4	2		3			2		3	
CO 5						2		3	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture, digital presentation	Mid-semester examination 1, Semester end examination
CO2	Lecture, digital presentation	Mid-semester examination 1, Semester end examination
CO3	Lecture, digital presentation	Quiz, Assignment, Mid-semester examination 2, Semester end examination
CO4	Lecture, digital presentation	Mid-semester examination 2, Semester end examination
CO5	Lecture, digital presentation	Assignment, Semester end examination

Books Recommended

1. **Spreiregen, P. D**: Urban Design: The Architecture of Towns and Cities
2. **Howard, S.E**: Garden Cities of Tomorrow

3. **Hou, J., Spencer, B., Way, T. and Yocom, K. eds**.: Now Urbanism: The future city is here. Routledge
4. **Mostafavi, M. and Doherty, G. eds**.: Ecological urbanism. Lars Müller Publishers
5. **Cho, I.S., Heng, C.K. and Trivic, Z.: Re-framing urban space:** Urban design for emerging hybrid and high-density conditions. Routledge
6. **Hall, P**.: Cities of tomorrow: an intellectual history of urban planning and design since 1880. John Wiley & Sons
7. **Rowe, C. and Koetter, F.:** Collage city. MIT press
8. **Utopia, E.:** Architectural Provocations 1956-76. New York, NY: Prestel Pub
9. **Lynch, K.:** Reconsidering the image of the city. Springer, Boston, MA
10. **Routledge**; Responsive environments: A manual for designers

Year/ Semester	**3rd Year 2nd Semester**		
Course Title	**Interior Design**		
Course Code	ARC 0212 3271	**Stream**	7
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

Interior design is more than an aesthetic. It is about to find the best solution for interior environment considering clients health, safety, comfort, aesthetic and functional feasibility. As integrated part of architecture interior design also plays vital role for involving human and built space.

COURSE OBJECTIVES:

- To help students to conceptualize basic theories of interior design and find out the scope of design.
- Make the students understand the vocabulary and principles of interior design.
- To help them to realize the environmental entities of interior space that plays significant role in interior design.
- To develop professional skills to work in a team.
- Helping the students to understand and maintain the professional ethics and design code during working process.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Explain interior design vocabulary and practice to develop the professional skills
CO 2	Apply the design principles in real interior projects
CO 3	Analyze color, texture, furnishing, acoustics and material of interior elements to understand the contextual idea of interior space
CO 4	Apply the interior design process for conducting research work and professional field as well

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2								
CO 2	2	2							
CO 3	2	2							
CO 4	2		3			2			

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	Mid-term examination 1, Semester-end examination
CO2	Simulation/field demonstration, Project-based learning	Mid-term examination 1, Assignment, Semester-end examination
CO3	Lecture	Mid-term examination 2, Semester-end examination
CO4	Lecture, Workshop	Mid-term examination 2, Assignment, Semester-end examination

Books Recommended

1. John E. Flynn et al: **Architectural Interior Systems; Lighting, Acoustics, Air**
2. Francis D. K. Ching, Corky Binggeli: **Interior Design Illustrated**
3. Joseph De Chiara, Julius Panero, and Martin Zelnik: **Time-Saver Standards for Interior Design and Space Planning**
4. Flynn J: **Conditioning**
5. Ladau R: **Color in Interior Design and Architecture**

Year/ Semester	3rd year 2nd semester		
Course Title	**Structure IV – Building Structures II**		
Course Code	CEE 0732 3211A	**Stream**	1
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

This course will enable students to conceptualize different types of structure. It also introduces fundamental design process of RCC structure and different types of foundation. It will also enable the students to realize, understand and design basic elements of simple steel structures.

COURSE OBJECTIVES

- To introduce students with deferent types of structures such as truss, arch, dome, shell, folded plate and shear wall. Understanding the prefabricated structures and pre-stressed concrete structures.
- To make familiar with the knowledge of analysis and design of RCC structures. Understanding the types of substructures.
- To make familiar with the joints, connections and design of steel structures.

COURSE CONTENT

Introducing deferent types of structures:
Introduction to various structural forms and systems. Truss, arch, dome, shell, folded plate, shear wall, etc. Concepts of pre-stressed concrete structures, prefabricated structures.

Fundamental design process of RCC structures:
Design of beam and slab in USD considering flexure, shear, torsion and deflection.

Fundamentals of building sub-structures:
Types of Foundations; Concept of Bearing Capacity and Settlement.

Fundamentals and design process of steel structures:
The forces in the members of a simple truss. Types of riveted and welded joints, Strength of a simple Lap Joint, Bearing type connection, Strength of a complex Butt joint: Bearing type connection, Friction type connection, welded connection.
Design of tension member, beam and column in LRFD.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Understand different types of structures
CO 2	Perceive, design and analyze RCC structures
CO 3	Understand the concepts of different types of substructures suitable for different soil conditions
CO 4	Apply critical understanding of the theory and principles of design and solution of basic elements of steel structures

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2					3		2	
CO 2	2					3		2	
CO 3	2					3		2	
CO 4	2					3		2	

Books Recommended

1. **Arthur H. Nilson, David Darwin, Charles W. Dolan** (2010), Design of Concrete Structures.14th Ed., McGraw Hill. ISBN–007-123260-5
2. **George Winter, Leonard Church, Charles Edward O'Rourke, Arthur H. Nilson** (1964), Design of Concrete Structures. 7th Ed., McGraw Hill. ISBN–007-123260-5
3. **M. Nadim Hassoun, Akthem Al- Manaseer** (2008), Structural Concrete. 4th Ed., John Wiley and Sons, Inc. ISBN– 978-0-470-17094-6.
4. **Housing and Building Research Institute**, Bangladesh (2006), Bangladesh National Building Code (BNBC- 2006)
5. **American Concrete Institute**, ACI Codes, 2003

Year/ Semester	3rd year 2nd semester		
Course Title	**Building Services II - Electrical**		
Course Code	EEE0713 3213A	**Stream**	1
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE
The intent of the subject is to make the students learn about the advanced electrical services with special reference to lighting and acoustics.

COURSE OBJECTIVES
- Help the students understand basic theories in conception of electrical units and standards.
- Make the students understand electrical drawing system, layout and estimation.
- To develop skills to design illumination and lighting System.

COURSE CONTENT
Electrical units and standards, Ohm's law, KVL and KCL, Basics of AC circuits, Introduction to electrical wiring, wiring system design, Fitting and Fixture layout, Conduit layout, drafting, and estimation. Design for illumination and lighting. Design for intercom, public address systems, telephone system and LAN. Design of security systems including CCTV, fire Alarm, smoke detector, burglar alarm, and sprinkler system. A design problem on a single/multi-storied building/structure.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Draw electrical wiring drawings
CO 2	Distinguish different electrical system ad instruments
CO 3	Illustrate simple electrical layout of single/ multi-storied structures
CO 4	Place lighting fixtures appropriately in a building

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2								2
CO 2	2	2							
CO 3	2	2			2				
CO 4	2	2							

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture, Problem-based learning	Mid-semester examination 1, Semester end examination
CO2	Lecture, self-learning	assignment, Mid-semester examination 1, Semester end examination
CO3	Lecture, Problem-based learning	assignment, Mid-semester examination 2, Semester end examination

CO4	Lecture, self-learning, Problem-based learning	Presentation (Group/Individual) Mid-semester examination 2, Semester end examination

Books Recommended

1. **S.L. Uppal and G.C.Grag**: Electrical Wiring Estimating and Costing
2. **Lechner, Norbert** (2012). Plumbing, Electricity and Acoustics: Sustainable Design Methods for Architecture. John Wiley & Sons, Inc., Hoboken, New Jersey.

Year/ Semester	**3rd Year 2nd Semester**		
Course Title	**Behavior Studies in Architecture**		
Course Code	ARC 0313 3273	**Stream**	7
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

This course emphasizes to understand diversity of behavioral needs, values, norms, human psychology in architectural design process.

COURSE CONTENT:

Man-environment relationship: Positive and normative theories. Behavioral science and modem movement. Substantive theory on environment and human behavior, Social stimulation and interaction, the affordances of the built environment. Gestalt theory of perception, Cognition and effect, special behavior. Environmental Determinism, Environmental possibilism and environmental probabilism. Concept of FIT-adoptability and flexibility.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Analyze behavioral study in architecture and planning
CO 2	Explain different theories of human behavior science
CO 3	Incorporate human behavior to create barrier-free and democratic built environment
CO 4	Explain human needs and feelings in buildings with relation to the lifestyle of humans within it
CO 5	Conduct further multidisciplinary research as well as design studio projects based on behavior studies

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1		2				2	2		
CO 2				2					
CO 3	2	2				2			
CO 4		2				2	2		
CO 5		2	3						

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture, text book	Mid-semester examination 1, Semester end examination
CO2	Lecture, self-learning	Mid-semester examination 1, Semester end examination
CO3	Lecture, project-based learning	assignment, Mid-semester examination 2, Semester end examination
CO4	Lecture, Problem-based learning	Presentation (Group/Individual), Mid-semester examination 2, Semester end examination
CO5	Self-learning	Semester end examination

Books Recommended

1. **Robert B. Bechtel(ed)**: Handbook of Environmental Psychology
2. **Amos Rapoport**: Theory in Environment Behavior Studies. (Journal)
3. **Joy Knoblauch**: The Architecture of Good Behavior

Year/ Semester	**3rd Year 2nd Semester**		
Course Title	**Building Information Modelling**		
Course Code	ARC 0732 3264	**Stream**	6
No. of Credits	2.0	**Course Hour**	4.0 hours/week

COURSE RATIONALE:

This course intends to equip the students with the strengths of Building Information Modeling technologies, widely used in architectural research and profession to stay updated with the global academic and professional race.

COURSE CONTENT:

Understanding the idea of Building information modeling. BIM overview, Developing competences on BIM Processes, BIM Technology, BIM Application. Overview of related software and Case Studies. BIM requirements and applications from around the world, BIM and the Futures Parametric design principles. Application of BIM for building modeling and integration with engineering services and building technology. Preparing construction documents for detail architectural design.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Operate BIM software such as ArchiCAD, Revit, Vectorworks, etc.
CO 2	Apply BIM software for parametric designs
CO 3	Formulate early conceptual design decisions using BIM software
CO 4	Analyze and Integrate building and engineering services using BIM
CO 5	Develop construction level modeling including detailing, specifications and cost estimation

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2				2				
CO 2	2	2							
CO 3		2						3	
CO 4	2	2				2		3	
CO 5	2				2			3	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture using projector	Assignment, Summative assessment
CO2	Project/tutorial	Continuous assessment, Summative assessment
CO3	Self-learning using reference	Quiz, Summative assessment
CO4	Guest lecturers/field visit	Continuous assessment, Summative assessment
CO5	Simulation/field demonstration	Assignment, Summative assessment

Books Recommended

1. **Richard Garber**: BIM Design: Realizing the Creative Potential of Building Information Modelling
2. **Randy Deutsch**: BIM and Integrated Design: Strategies for Architectural Practice
3. **Chuck Eastman et al**: BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers, and Contractors, John Wiley & Sons Inc., 2008

Year/ Semester	**3rd Year 2nd Semester**		
Course Title	Building Services III- Plumbing		
Course Code	ARC 0732 3263	**Stream**	6
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

This course intends to teach the students the design and application of plumbing and drainage systems inside and outside the buildings.

COURSE OBJECTIVES:

- To provide the knowledge of the basic concepts of water supply system.
- To introduce the students with sanitation and water treatment systems in buildings.
- Applying the knowledge to determine water requirements and capacity.
- Helping the students to understand the solid-waste management and drainage system of different buildings.

COURSE CONTENT:

Water Supply: sources, demand, treatment and distribution of water. Sources of water supply, Plumbing system types for various buildings. Quality of potable water. Calculation of water requirements for various building types. Water treatment methods– Screening, Aeration, Sedimentation, Filtration, Disinfection, Softening. Storage and distribution of water. Choice of pipe materials, types of fixtures and fittings. Sanitation: Introduction to various sanitary pipes, joints, fittings and fixtures, their function, placement and constructional details. Principles of storm water drainage. Types of drain pipes. Storm water gutter / Storage sumps. Study of storm water disposal at site and settlement level. Rain water harvesting system. Recycling of water. Waste water treatment and disposal methods. Solid waste, collections, treatments and disposal. Biogas system and Modern renewable energy system.

Application: Layout design and construction. Layout design and details of water supply distribution system in a Campus. Layout design and details of sewage and drainage system for different building types. Storm water drainage and rain water harvesting system design for a building project. Study of internal & external drainage system of various buildings including small residences, apartments, public buildings etc. Single stack system, one pipe and two pipe systems, Gradients used in laying drains and sewers.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Calculate water use, requirements and capacity
CO 2	Explain waste water treatment and disposal methods
CO 3	Design storm water drainage & rain water harvesting system
CO 4	Implement the knowledge about solid waste collections, treatments and disposal
CO 5	Distinguish appropriate plumbing fixtures and fittings for multi-storied buildings

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	2							
CO 2	2								
CO 3	2							3	
CO 4	2							3	
CO 5	2	2							

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture, problem-based learning	Mid-term examination 1,

		Semester-end examination
CO2	Lecture, self-learning	Mid-term examination 1, Semester-end examination
CO3	Lecture, project-based learning	Assignment, Mid-term examination 2, Semester-end examination
CO4	Lecture, digital presentation	Mid-term examination 2, Semester-end examination
CO5	Lecture, project-based learning	Assignment, Semester-end examination

Books Recommended

1. Lechner, Norbert (2012). **Plumbing, Electricity and Acoustics: Sustainable Design Methods for Architecture**. John Wiley & Sons, Inc., Hoboken, New Jersey.
2. B.C. Punmia (2009). **Waste Water Engineering**, Laxmi Publications.
3. S.J. Arceivala (2008). **Waste Water Treatment for Pollution Control**. Tata McGraw Hills Publication.
4. K.N. Duggal (2010). **Elements of Environmental Engineering**, Chand & Co.
5. Charanjeet S. Shah (2015). **Water Supply and Sanitation**; Galgotia Publication.

Year/ Semester	**4th Year 1st Semester**		
Course Title	**Landscape Design**		
Course Code	ARC 0731 4171	**Stream**	7
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

This course offers landscape design theories, principles, concepts, planning and design process to organize the outdoor spatial and environmental aspects from both object and system-based approaches.

COURSE CONTENT:

Introduction to the Landscape Architecture and its necessity in the built environment. Historical development of landscape/ garden/ parks design. The elements, basic principles, process and narratives of landscape design. Concepts and techniques of environmental and ecological design for various eco-system (e.g., wetland, forest, grassland…). The landscape profiles of biosphere, eco-system, context, flora and fauna. Vegetation design: Planting and gardening. Sustainability concept in landscape design (e.g., productive landscape, urban agriculture…).

Landscape character and scale, visual landscape: spatial quality and forms, circulation and linkages, location and sequence of outdoor activity. Study of site analysis, site selection, site development, plane surveying, topography, soils, grading, drainage, site utilities and maintenance. Environmental assessment for landscape planning and design.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Explain the basics principles and elements of landscape design
CO 2	demonstrate an ability to implement design process into landscape design projects
CO 3	identify and analyze the existing landscape networks and contextual issues related to urban landscape trough different methods
CO 4	Critically evaluate the local and regional framework related to landscape design with collaboration approaches
CO 5	Implement landscape design approaches for site-specific problems

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs:

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3							
CO 2	2	3							
CO 3						3			
CO 4					2	3			
CO 5		2				3			

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	Mid-term examination 1, Semester-end examination
CO2	Lecture	Mid-term examination 1, Semester-end examination
CO3	Lecture	Mid-term examination 2, Semester-end examination
CO4	Demonstration	Assignment, Mid-term examination 2, Semester-end examination
CO5	Lecture	Assignment, Semester-end examination

Books Recommended

1 **John O. Simonds, S. Barry**, *Landscape Architecture: A Manual of Environmental Planning and Design*. Fourth Edition, McGraw-Hill Education, 2013

2 **D. Catherine**, *Form & Fabric in Landscape Architecture: A Visual Introduction*. London and New York, 2001

3 **Ian L. McHarg**, *Design by Nature*. New York: J. Wiley, 1995

4 **Turner T**.: *City as Landscape*, Taylor & Francis, 1995

5 **Alexander C. et al**: *A Pattern language*, Oxford University Press, 1977

Year/ Semester	4th year 1st semester		
Course Title	**Design Studio VII**		
Course Code	ARC 0731 4132	**Stream**	3
No. of Credits	6.0	**Course Hour**	12.0 hours/week

COURSE RATIONALE:

This studio introduces urban issues to the students. They learn to investigate socio-economic issues and attempt to make sustainable proposals. During urban survey the students come to direct interaction with stakeholders and learn to design spaces sensibly. The projects intend to teach how to be more responsive to local context and work for greater benefit of

people from different social classes. Conservation of buildings and places with historical and cultural significance is also practiced during the studio projects.

COURSE CONTENT:

Perception of urban context and the emergent forces that shape a city; Understanding urban activities, movement and environmental aspects to attain livability in cities and quality of life; Understanding urban design process – from program formulation to urban design interventions. Designing spaces between the buildings vis-à-vis urban masses respond to human needs and scale. Articulation of architecture into the public realm through design of building complexes at urban scale.

COURSE LEARNING OUTCOMES:

CO 1	Conduct urban structure survey; land-use, infrastructure, transportation, environment, socio-cultural, socio-economic survey
CO 2	Analyze and Interpret numeric and social data in visual presentation and further research
CO 3	Develop rational design solutions and respect the context in urban design
CO 4	Apply urban design techniques and strategies
CO 5	Create detailed area plan and design open urban and neighborhood space with collaborative way

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	2							
CO 2		2	2					2	3
CO 3	2					3			
CO 4	2					3			
CO 5	2	2			3				

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Case study, Field Survey	Group Presentation, Summative Assessment
CO2	Project, lecture	Continuous Assessment, Summative Assessment
CO3	Project, lecture	Continuous Assessment, Summative Assessment
CO4	Project, lecture	Continuous Assessment, Summative Assessment
CO5	Project, lecture	Summative Assessment

Books Recommended

1. **Gehl, J**.: Cities for people. Island press.
2. **Jacobs, J**.: The death and life of great American cities. 1961. New York: Vintage.
3. **Gindroz, R**.: The urban design handbook: techniques and working methods. WW Norton & Company.
4. **Alexander Garvin** ; The Planning Game – Lessons from Great Cities
5. **Kevin Lynch** : The image of the city.
6. **Jeff Speck** ; walkable city
7. **Charles Montgomery** : Happy City: Transforming Our Lives Through urban design

Year/ Semester	**4th Year 1st Semester**		
Course Title	**Art and Architecture V: Society and Architecture of Bengal**		
Course Code	ARC 0731 4121	**Stream**	2
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

This course will explore the historic structure and philosophical aspects of Bengal architecture. This course also intends to develop skills for context based cultural interpretation of built environment through survey and analysis of historic structures of Bengal.

COURSE OBJECTIVES

- Helping the students to understand the chronological changes in the society of Bengal and their belief.
- To facilitate necessary knowledge about the cultural history of human development in different areas of this region.
- To develop skills to study cultural force on architectural development through Bengal focusing on religious architecture.
- To provide the knowledge of construction techniques, structural evolution, material cultural through different age of Bengal architecture with emphasis on architecture and their planning.
- Acquaint students with the influence of Bengal heritage on development art and architecture in Modern era and their practices.

COURSE CONTENT

Study of society, culture and Architecture of Bengal through the ages: Mauryan, Pala, Sena, Sultanate and Mughal periods. Language, custom, art and literature, and their relevance to Architecture and planning.

Study of society, culture and Architecture of Bengal through the ages: Colonial and post-colonial Bengal. Language, custom, art and literature, and their relevance to Architecture and planning. Contemporary architecture of Bangladesh – analyzing the roots and global forces.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	distinguish between various architectural styles emerged from Buddhist architecture to Muslim Architecture in Bengal
CO 2	Critically analyze the different phases of development in architecture of Bengal with relevance to their structure, material culture and construction technique
CO 3	build a chronological framework for further research in the development of Society of Bengal in the medium of Secular and Religious Architecture
CO 4	identify the impact of religious philosophy along with political ideology on society and architectural of Bengal
CO 5	formulate the theories in the history of Architecture of Bengal with relation to socio-cultural, socio-political, environmental and ecological contexts

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONAL SKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3							
CO 2		2				3			
CO 3		2	3						
CO 4		2					3		
CO 5			3		2	3			

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-Learning Strategy	Assessment strategy
CO1	Lecture	Midterm Examination 1, Semester-end Examination
CO2	Lecture, Documentaries	Midterm Examination 1, Quiz, Semester-end Examination
CO3	Seminar, Guest lectures	Midterm Examination 2, Presentation (Individual/Group), Semester-end Examination
CO4	Lecture, Workshop, Guest lectures	Midterm Examination 2, Presentation (Individual/Group), Semester-end Examination
CO5	Lecture, Guest lectures	Midterm Examination 2, Semester-end Examination

Books Recommended

28. **Nazimuddin Ahmed**: Discover the monuments of Bangladesh
29. **Nazimuddin Ahmed**: Buildings of the British Raj in Bangladesh
30. **H Dani:** Muslim Architecture of Bengal, Cultural Survey of Bangladesh by Asiatic Society
31. **A B M Hossain:** Architecture, Cultural Survey of Bangladesh by Asiatic Society
32. **Sufi M Rahman**: Archaeological Heritage, Cultural Survey of Bangladesh by Asiatic Society
33. **A S M Ahmed**: Mosque Architecture in Bangladesh
34. **Perween Hasan**: Sultans and Mosques: The Early Muslim Architecture of Bangladesh
35. **Ahmed Babu, Chowdhury Nazly, Alam Shafiqul:** Selected Hindu temples of Bangladesh

Year/ Semester	**4th Year 1st Semester**		
Course Title	**Heritage studies and Conservation**		
Course Code	ARC 0222 4123	**Stream**	2
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

This course intends to develop skills for understanding heritage issues and train students with fundamental ideas of heritage conservation management practice.

COURSE CONTENT:

Part A: Understanding heritage: Understanding heritage and process of heritagization. Relation with heritage, memory, and place. Understanding conservation: Architectural & Urban Conservation; Its meaning, principles, and scope; Definition of conservation; Preservation, restoration, renovation, reconstruction, adaptation, reuse, redevelopment, renewal, etc. at building and urban scale. History of conservation movements in the world. International conservation laws and role of UNESCO. Ethics in Conservation, degrees of intervention in historic buildings and monuments, and why to conserve issue. Conservation issues and context. Conservation policy, ethics, regulations, technology, and finance. Policies, legislations, and agencies of conservation

Part B: Understanding systematic Conservation Process and planning. Causes of decay and deterioration of cultural property: External causes of decay. The context of inspecting the historic building, documentation, mapping, and analysis. Preparation of inspection report. Techniques for restoration, preservation, and rehabilitation. Concepts of historic towns, quarters, and areas of heritage Zone and integrated conservation. Planning and management aspects in conservation re-use and redevelopment of historic buildings and areas. Local and International case study and good practices.

COURSE LEARNING OUTCOMES:

CO 1	Demonstrate a comprehensive understanding of the concepts, theories, and principles related to heritage, including the significance and value assessment
CO 2	Apply ethical considerations in heritage management and decision-making processes through national and international laws, charters, and conventions related to heritage conservation
CO 3	Develop skills in heritage management through various forms of interpretation, and inventory techniques, including architectural surveys, archival research, photography, and digital documentation and collaborative way
CO 4	Identify potential risks and threats to heritage sites, conduct risk assessments, and develop strategies to mitigate damage and ensure the safeguarding of cultural heritage
CO 5	Critically evaluate the effectiveness of different approaches through the knowledge of conservation principles to assess, preserve, and restore cultural heritage sites and further research

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3					3		
CO 2				3			3		
CO 3					2	3	3		
CO 4						3	3		
CO 5			3			3			

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	Mid-term examination 1, Semester-end examination
CO2	Lecture,	Assignment, Mid-term examination 1, Semester-end examination
CO3	Lecture, Simulation/field demonstration, Guest Lecture	Assignment, Semester-end examination
CO4	Lecture, Documentary	Mid-term examination 2, Semester-end examination
CO5	Lecture	Mid-term examination 2, Semester-end examination

Books Recommended

1 **B.M. Fieldon**: The conservation of Historic Buildings
2 **Peter J Larkham**: Conservation and the City
3 **Graeme Aplin**: Heritage Identification, Conservation and Management
4 **Aylin Orbasli**: Architectural conservation
5 **Miles Glendinning**: The Conservation Movement: A History of Architectural Preservation-Antiquity to Modernity

Year/ Semester	**4th Year 1st Semester**		
Course Title	**Interior Design Studio**		
Course Code	ARC 0212 4172	**Stream**	7
No. of Credits	2	**Course Hour**	4.0 hours/week

COURSE RATIONALE:

This course is the first approach to the profession of interior design for architecture student. Students will be introduced to the design process, elementary design vocabulary and various presentation skills and techniques. Professional practices and responsibilities, trade resources, and the value of design organizations will be discussed. Through a series of projects and activities and an exPOration of the work of notable interior designers and architects, students will begin to identify the various aspects of interior design to which they personally respond.

COURSE OBJECTIVES:

- Acquaint students with the scope of interior design and basic theories about interior design.
- Helping the students to develop ability in applying the design method and principal of interior design based on contextual issues.
- Apply the knowledge of the method of local practice and resource available for interior design.
- To develop the skill of verbal and technological representation of the interior design project.

COURSE CONTENT:

Preparation of interior design drawings for different types of spaces such as office, studio, bank, restaurant, club and shop. Detailed specifications of finish materials for floor, ceiling and wall. Natural and artificial lighting and ventilation. Fixed and movable furniture, decorative element, upholstery, drapery, art work, interior plantation, fountain, automation device.

COURSE LEARNING OUTCOMES:

CO 1	apply the knowledge in order to perform professional skill
CO 2	apply the design method and principles in any real interior design project
CO 3	draw professional drawing required to communicate for an interior design project
CO 4	Analyze the material quality and their specification used in interior project and to apply the appropriate one according to contextual feasibility
CO 5	Calculate the cost-estimation in interior projects and to be acquainted with the market regarding material cost

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	2							
CO 2	2					3			3
CO 3	2				3				
CO 4	2	2				3			
CO 5	2	2							

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Project, lecture	Group Presentation, Summative Assessment
CO2	Project, lecture	Continuous Assessment, Summative Assessment
CO3	Project, lecture	Continuous Assessment, Summative Assessment
CO4	Project, lecture	Continuous Assessment, Summative Assessment
CO5	Project, lecture	Summative Assessment

Books Recommended

1. **John E. Flynn et al**: Architectural Interior Systems; Lighting, Acoustics, Air
2. **Francis D. K. Ching, Corky Binggeli**: Interior Design Illustrated
3. **Joseph De Chiara, Julius Panero, and Martin Zelnik**: Time-Saver Standards for Interior Design and Space Planning
4. **Flynn J**: Conditioning
5. **Ladau R**: Color in Interior Design and Architecture

Year/ Semester	**4th Year 1st Semester**		
Course Title	**Housing**		
Course Code	ARC 0731 4181	**Stream**	8
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

Living accommodation is one of the most important ingredients to let human existence to survive. This course will ensure the knowledge about all aspects of living accommodation system which will let the students capable to design housing according to the needs.

COURSE CONTENT:

Introduction and history to house and housing. Housing and Community; Housing influences on individuals, family, group, societies and environment, Housing Entrepreneurship; Role of private, public, NGO and PPP sectors in housing; Housing finance; Space standards and allocation; Housing infrastructure and design requirements.

Physical, social, economic and technical aspects of housing problems in Bangladesh; Housing policy and Planning; Legislations and regulations; Low-cost and low-income group housing; Current housing practice, material, technologies and market scenario in Bangladesh and abroad.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Distinguish relationship between community and housing, housing needs and influences.
CO 2	Analyze contextual housing problems, policy and design aspects
CO 3	Evaluate Housing design methods, research methods, implementation technologies, computer technologies to execute a qualitative and quantitative housing
CO 4	Create a new innovative method by individual and/or cooperative works locally, nationally and internationally
CO 5	Formulate new design approaches according to local and regional framework

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs:

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	2							
CO 2		2				3			
CO 3		2	2			3			
CO 4	2	2			3	3			
CO 5	2							3	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	Mid-term examination 1, Semester-end examination
CO2	Lecture,	Mid-term examination 1, Semester-end examination
CO3	Lecture, Demonstration	Oral presentation, Assignment, Mid-term examination 2, Semester-end examination
CO4	Lecture	Mid-term examination 2, Semester-end examination
CO5	Lecture	Assignment, Semester-end examination

Books Recommended

1. **Adams, T**., *'The Design of Residential Area'*, Harvard University Press, 1934.
2. **Aldersons, S**., *'Housing'*, Penguin, 1962,
3. **Hamdi, N**.: *Housing Without Houses: Participation, Flexibility, Enablement*, 1995

4. **Turner, C., John**, *'Housing Priorities, Settlement Pattern and Urban Development in Modernizing Countries'*, 1968.
5. **Basu, A. R**.: *Urban Squatter Housing in the Third World*, 1988
6. **Wittkauer, R**., *'Architectural Principles and the Age of Humanism'*, Tiranti, 1952.
7. **Schoenauer, N**.: *6,000 Years of Housing*
8. **Ameen, Shahidul, Rahaman, M**., *'Transformation Properties in Shelter Generation: Study of a Government Built Low-Cost Housing Development Scheme'*, (Housing Development and Management, Center for Built Environment, 1996, ISBN-86699.00-7)

Year/ Semester	**4th Year 1st Semester**		
Course Title	**Field Work II: Architecture of Bengal**		
Course Code	ARC 0222 4122	**Stream**	2
No. of Credits	2.0	**Course Hour**	1 week

COURSE RATIONALE

This course plays a supplementary role to the corresponding theory course on society and Bengal architecture.

COURSE OBJECTIVES

- Acquaint students with the influences of heritage, religion, culture, politics and climate on the development of Bengal architecture.
- Helping the students to acquire practical experience of the heritage building sites of Bengal.
- To facilitate the students with a scope to meticulously explore construction details of the heritage buildings.

COURSE CONTENT

Students will visit historical buildings and structures in Bangladesh relevant to the course. Through the field work students will be engaged with activities relating with historic building documentation and analysis. Students are required to submit a report / travel blog after finishing the trip.

LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	explain the development of Bengal architecture from Buddhist to later periods from practical experience
CO 2	Illustrate verbal and visual presentations on heritage architecture
CO 3	identify the heritage construction techniques and details
CO 4	evaluate the heritage architecture of Bengal with relation to socio-cultural, socio-political, environmental and ecological contexts
CO 5	write and publish travel blog/ documentary in website

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2					3			
CO 2									3
CO 3		2					3		
CO 4		2				3			
CO 5							2		3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture with projector, Self-learning	Presentation (Individual/group), Summative assessment
CO2	Documentaries, Guest lectures, Self-learning	Presentation (Individual/group), Summative assessment
CO3	Workshop, Field visit	Presentation (Individual/group) /Viva voce, Summative assessment
CO4	Workshop, Field visit	Presentation (Individual/group) /Viva voce, Summative assessment
CO5	Workshop, Field visit	Presentation (Individual/group), Publication, Summative assessment

Books Recommended

1. **Nazimuddin Ahmed**: Discover the monuments of Bangladesh
2. **A B M Hossain:** Architecture, Cultural Survey of Bangladesh by Asiatic Society

Year/ Semester	**4th Year 1st Semester**		
Course Title	**Computer Aided Spatial Analysis**		
Course Code	ARC 0532 4162	**Stream**	6
No. of Credits	2.0	**Course Hour**	4.0 hours/week

COURSE RATIONALE:

This course intends to equip students with deeper understanding of computer application in analysis of urban data. Application of GIS in spatial analysis and urban survey will expand the career opportunity of the graduates in coming years.

COURSE CONTENT:

Introducing spatial analysis tools to support urban design and planning studio. Introduction to Geographic information system (GIS) and its application in spatial analysis. Understanding concepts of decision support tools in advanced design and planning process for architecture. Training on web based free spatial analysis tools like space syntax, open street map, mapbox, etc.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Operate the spatial simulation software such as ArcGIS, Space Syntax, etc.
CO 2	Transforming cad files to GIS shapfiles to record urban data

CO 3	Illustrate GIS based mapping and spatial analysis for advanced urban planning and design
CO 4	Utilizing analytical capacity and speed of GIS to process large scale urban data and demonstrate different combinations of analytical methods
CO 5	Apply and use other web based spatial analysis platforms like open street map, mapbox, space syntax, etc.

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2							2	3
CO 2								2	3
CO 3								2	3
CO 4						2	2	2	3
CO 5								2	3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Project, workshop	Summative Assessment
CO2	Project, workshop	Summative Assessment
CO3	Project, workshop	Summative Assessment
CO4	Project, workshop	Summative Assessment
CO5	Project, workshop	Summative Assessment

Books Recommended

1. **Wilpen L. Gorr & Kristen S. Kurland**: GIS Tutorial 1 for ArcGIS Pro: A Platform Workbook.
2. **David Smith et al.**: Understanding GIS

Year/ Semester	**4th Year 1st Semester**		
Course Title	**Architecture for Sustainability**		
Course Code	ARC 0712 4173	**Stream**	7
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

The course focuses on the present sustainability concept and design practice of energy efficiency and technological advancement in the field of Architecture. The study area includes successful practices, innovative ideas and possibilities with international cooperative measures to guide clear understanding in this study field.

COURSE CONTENT:

Basic concept of sustainability and built environment design. Environmental forces and built form interaction. Passive means of built environment control. Built environment design in the local context. Concepts in bioclimatic design. Water and wetland architecture. Basic concepts of recycling, renewability and conservation in design;

Urban ecology and responsive environment; Sustainable building materials and construction; Green building concept, Environmental analysis, accounting and monitoring of buildings; Technologies for built environment design. Climate change and adaptation.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Explain the basic concept and relation between sustainability and architecture
CO 2	Compare the aspects and necessity of sustainable design practice
CO 3	distinguish various historical practices on basis of different climatic and cultural context and relate with modern day practice
CO 4	compare between different trends of sustainable design practice ongoing around the world and apply technology-based solutions on, decision making and design
CO 5	Formulate appropriate solutions for the sustainable design practice in the country or region

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	2							
CO 2	2	2							
CO 3	2	2				3			
CO 4	2	2				2		3	
CO 5	2	2				3			

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture using projector	Mid-term examination 1, Semester-end examination
CO2	Lecture using projector	Mid-term examination 1, Semester-end examination
CO3	Lecture using projector	Mid-term examination 2, Semester-end examination
CO4	Guest lecturers/field visit	Assignment, Mid-term examination 2, Semester-end examination
CO5	Field demonstration	Assignment, Semester-end examination

Books Recommended

1. **David Loyed Jones**: Architecture and the environment.
2. **Daniel E. Williams**: Sustainable design, ecology, architecture and planning
3. **David Bergman**: Sustainable Design: A Critical Guide (Architecture Briefs)
4. **Krisnan,Baker,Yannas**: Climate Responsive Architecture
5. **Patrick M Condon**: Design Charrettes for Sustainable Communities
6. **Stephen R J Sheppard**: Visual Simulation
7. **Terri Meyer Boake**: Lecture series on sustainable Architecture (www.slideshare.net)

Year/ Semester	**4th Year 1st Semester**		
Course Title	**Rural Studies of Bangladesh**		
Course Code	ARC 0731 4183	**Stream**	8
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:
This course intends to introduce students to development issues in the rural context through planning and management.

COURSE CONTENT:
Understanding the rural context of Bangladesh. Nature, scope and models of integrated rural development. The background of rural planning and development and the social, economic and physical context. Review of rural settlement and spatial pattern in Bangladesh. Rural planning and development in the post-independence period. Importance of Community planning and development concepts. Problems and issues in rural development: population, urbanization and migration. Rural governance, services and infrastructure. Institutions for rural development. Policies and strategies of rural development. Study of contemporary innovation and practices in rural sectors. Energy efficient rural planning and environmental protection.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	explain the physical and social aspects of the rural built environment.
CO 2	implement design strategies for rural contexts and communities.
CO 3	integrate participatory approaches with rural development.
CO 4	Identify and resolve housing issues based on rural society, occupation and economy.
CO 5	Apply innovative new technologies for sustainable practices in the rural context.

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONAL SKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3							
CO 2		2				3			
CO 3		2			3	3			
CO 4	2	2							
CO 5			2			2		3	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-Learning Strategy	Assessment strategy
CO1	Lecture using projector	Mid-term examination 1, Semester-end examination
CO2	Lecture using projector	Mid-term examination 1, Semester-end examination
CO3	Lecture using projector	Mid-term examination 2, Semester-end examination
CO4	Lecture using projector	Assignment, Mid-term examination 2, Semester-end examination
CO5	Lecture using projector	Assignment, Semester-end examination

Books Recommended

1. Rahman, Prof. Golam (2008***). Town Planning and the Political Culture of Planning in Bangladesh***. A H Development Publishing House: Dhaka.
2. Mustafa, Golam (2007). ***Rural Urban Planning 01.*** A H Development Publishing House: Dhaka.
3. Driscoll, Catherine (2017). ***Cultural Sustainability in Rural Communities***. Routledge: London and New York.
4. Caldwell, Wayne J. (2015). ***Planning for Rural Resilience: Coping with Climate Change and Energy Futures.*** University of Manitoba Press: Canada.

Year/ Semester	**4th Year 2nd Semester**		
Course Title	**Vernacular Architecture and Settlements**		
Course Code	ARC 0731 4271	**Stream**	7
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:
To inculcate an appreciation of vernacular architecture; as an expression of local identity and indigenous traditions of the culture.

COURSE CONTENT:
Defining vernacularism; House form in relation to culture, Vernacular architecture and settlement and its evolution; Concepts and approaches to the study and analysis of vernacular architecture. Vernacular architecture around the world: Symbolism and cultural expression generating vernacular building form and texture. Vernacular

architecture study and survey methods. Change facing vernacular architecture in the contemporary context.

Different Geo-climatic regions of Bangladesh and impact on architectural types and its uses. Understanding vernacular architecture of Bangladesh: from aspects of Microclimate and its impact on the local architecture, local construction methods, material culture and craftsmanship detail. Influence of cultural and social belief in formation of vernacular architecture in Bangladesh. Ecology and environmental aspects of traditional built forms and settlement systems. Issues of Housing and institutional building design in vernacular context in Bangladesh. Learning from vernacular architecture: Site & Context; Self-help and community-based approaches. Future directions and prospects.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Apply vernacular architecture as a reasonable tool for a novice to understand the triangular relationship of society, architecture and physical context and its impact on design
CO 2	analyze regional variety of architectures logically stemming from the geo-climatic forces, human and material resources, and techniques that satisfy the socio-cultural needs and desires of a given people
CO 3	Distinguish the vernacular settlement type of different geo-climatic regions of Bangladesh
CO 4	Formulate research and conduct surveys on vernacular built-forms in appropriate methods
CO 5	Utilize and implement lessons learned from the self-built architecture, in achieving sustainability and decisions that conserve natural and built resources, in future design studio projects

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs:

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	2				2			
CO 2		2				2			
CO 3	2	2							
CO 4			3						
CO 5			3			2		3	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture using projector	Mid-semester examination 1, Semester end examination
CO2	Lecture, assignment	Mid-semester examination 1, Assignment, Semester end examination
CO3	Lecture, self-learning	Mid-semester examination 2, Semester end examination
CO4	Lecture, self-learning	Mid-semester examination 2, Semester end examination
CO5	Lecture, self-learning	Presentation, Semester end examination

Books Recommended

1. Amos Rapoport: House form and culture
2. Bernard Rudofsky: Architecture Without Architects
3. Paul Oliver: Dwellings
4. Willi Weber(ed): Lessons from Vernacular Architecture
5. R. W. Brunskill: Vernacular Architecture: An Illustrated Handbook
6. Henry Glassie: Vernacular Architecture (Material Culture)
7. K. Iftekhar Ahmed: Up to the waist in Mud!
8. A.K.M. Kausarul Islam: Patterns and Changes of Vernacular Architecture in Bangladesh
9. Johan Van Lengen: The Barefoot Architect
10. K. Iftekhar Ahmed, Salek M. Seraj: Building Safer Houses in Rural Bangladesh (2004)
11. John May: Handmade houses & other buildings: the world of vernacular architecture
12. Sandra Piesik: Habitat! Vernacular Architecture for a Changing Planet

Year/ Semester	**4th Year 2nd Semester**		
Course Title	**Design Studio VIII**		
Course Code	ARC 0731 4232	**Stream**	3
No. of Credits	6.0	**Course Hour**	12.0 hours/week

COURSE RATIONALE:

This studio introduces students to various processes of urban design required for particular problem-solving strategies in urban areas. Students are introduced to a large block development process by addressing contextual issues. Designing a housing project in a particular context is an exercise for students that ensure skills and knowledge regarding large scale and community design. Understanding the process in order to design housing for a community and their impact on the environment.

COURSE CONTENT:

Study of city image, people perception of urban environment, physical development and municipal services through simulation, mapping and physical investigation. Projects focusing on urban renewal, regeneration, conservation, redevelopment and rehabilitation for urban areas. Investigation, analysis and design of housing/ communities with specific themes and their impact on the social, cultural and natural environment.

COURSE LEARNING OUTCOMES:

CO 1	Distinguish various process of urban design as urban renewal, rehabilitation, regeneration and conservation
CO 2	Apply the urban design method based on contextual issues for a particular problem in urban area

CO 3	Analyze the data collected for understanding the community specially its social, infrastructural, economic, and other aspects
CO 4	Design a housing project for thematic community through addressing social, economic, and environmental framework
CO 5	Illustrate physical master plan of a housing project and other detail through computer technology for communication

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3							
CO 2		2				3			
CO 3		2			2	3			
CO 4						3			
CO 5								2	3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Case study, Field Survey	Group Presentation, Summative Assessment
CO2	Field Survey, Project, lecture	Continuous Assessment, Summative Assessment
CO3	Project, lecture	Continuous Assessment, Summative Assessment
CO4	Project, lecture	Continuous Assessment, Summative Assessment
CO5	Project, lecture	Summative Assessment

Books Recommended

1. **Gehl, J**.: Cities for people. Island press.
2. **Jacobs, J**.: The death and life of great American cities. 1961. New York: Vintage.
3. **Gindroz, R**.: The urban design handbook: techniques and working methods. WW Norton & Company.
4. **Alexander Garvin** ; The Planning Game – Lessons from Great Cities
5. **Kevin Lynch** : The image of the city.
6. **Jeff Speck** ; walkable city
7. **Charles Montgomery** : Happy City: Transforming Our Lives Through urban design
8. **David Levitt ;** The Housing Design Handbook A Guide to Good Practice
9. **Bernard Leupen, Harald Mooij ;** Housing Design A Manual

Grahm towers ; Introduction to Urban Housing Design

Year/ Semester	**4th Year 2nd Semester**		
Course Title	**Landscape Design Studio**		
Course Code	ARC 0731 4272	**Stream**	7
No. of Credits	2.0	**Course Hour**	4.0 hours/week

COURSE RATIONALE:

This course offers a studio-based landscape design study, concepts, tools and techniques to organize/design the outdoor environment from both object and system-based approaches.

COURSE CONTENT:

Study of landscape area, natural and manmade elements, spatial aspects, drawings and outdoor elements and environment.

Analysis of a given case site and preparing a report on landscape study. Landscape graphics; Application of the principles and techniques of landscape design through design exercises of site planning and area development. Design of utility, maintenance and services.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Explain the spatial aspects of landscape design in terms of natural and manmade landscape elements
CO 2	Distinguish landscape design and functional requirements of scale-specific projects
CO 3	Analyze the existing landscape networks and contextual issues related to urban landscape
CO 4	Formulate integrated design approaches according to local and regional framework.
CO 5	Illustrate landscape plans and develop 3D models for landscape projects

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs:

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3							
CO 2	2	3							
CO 3		2				3			
CO 4		2			2	3			
CO 5								2	3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Case study, Field Survey	Group Presentation, Summative Assessment
CO2	Project, lecture	Continuous Assessment,

		Summative Assessment
CO3	Project, lecture	Continuous Assessment, Summative Assessment
CO4	Project, lecture	Continuous Assessment, Summative Assessment
CO5	Project, lecture	Continuous Assessment, Summative Assessment

Books Recommended

6 **John O. Simonds, S. Barry**, *Landscape Architecture: A Manual of Environmental Planning and Design*. Fourth Edition, McGraw-Hill Education, 2013

7 **D. Catherine**, *Form & Fabric in Landscape Architecture: A Visual Introduction*. London and New York, 2001

8 **Ian L. McHarg**, *Design by Nature*. New York: J. Wiley, 1995

9 **Turner T**.: *City as Landscape*, Taylor & Francis, 1995

10 **Alexander C. et al**: *A Pattern language*, Oxford University Press, 1977

Year/ Semester	4th year 2nd semester		
Course Title	**Architectural Research Methodology**		
Course Code	ARC 0731 4291	**Stream**	9
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

The course explains various methods for conducting meaningful inquiry and research in the field of built environment. In particular, the difference between research and design expresses the process in built environment research.students will gain an overview of research intent and design, methodology and technique, format and presentation, and data management and analysis. The course will develop each student's ability to use this knowledge to become more effective in the field of architecture research.

COURSE CONTENT:

Introducing research as a tool for architectural design. Scope and importance of academic research in the design process. Distinguish between research by design and design by research approach. illustration of literature review and research question. Step wise methods of architectural design research.
architecture research strategies ; historical research, qualitative research, correlation research and case study research. Methods for architectural program formulation. Analogy and concept selection and development of an architectural program. Development of design guidelines and checklists. Design development strategy in a specific context / site. Writing skills and Referencing, as well as Verbal and Written presentation skills and techniques would be assessed throughout the semester. Research design, Data collection, analysis and decision-making process.

COURSE LEARNING OUTCOMES:

CO 1	explain the fundamentals of research and architecture research process.
CO 2	application of literature review to find research problems and generating hypotheses.
CO 3	evaluation of various architecture research methods and strategies.
CO 4	application of data collection and survey processes.
CO 5	able to write thesis paper and formulate programs for architecture design

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3							
CO 2			2			3			
CO 3			2			3			
CO 4		2				3			
CO 5		2							3

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	lecture, paper review	Assignment
CO2	lecture, digital presentation	Oral Presentation
CO3	lecture, paper review	Assignment
CO4	lecture, paper review	Assignment
CO5	lecture, digital presentation	Oral Presentation

Books Recommended

1. Groat, L. N. and Wang, D. (2013) *Architectural Research Methods.* 2nd edition. The USA: John Wiley & Sons, Inc.
2. Kothari, C. R.. (2004) *Research Methodology.* 2nd revised edition. New Delhi, India: New Age International (P) Ltd., Publishers.
3. Cohen, U. and van Ryzin, L. (1979) 'Research in Architecture' in Snyder J. C. (ed.) *Introduction to Architecture*. The USA: Mcgraw Hills, pp. 401-411.

Year/ Semester	**4th Year 2nd Semester**		
Course Title	**Community Architecture and Planning**		
Course Code	ARC 0731 4281	**Stream**	8
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

This course intends to teach students concepts of community planning with special attention to participatory approaches in architectural design.

COURSE CONTENT:

Introducing community planning and design in architecture. Developing ideas of neighbourhood, community and society. Ideas of Co-creation and participatory design approaches. Understanding environmental issues within the community. Relationship of community and culture. Socio-cultural basis of the design of communities. Orientation and identity in community architecture. Creating a sense of place and sense of time. ExPOring types of communities (e.g., crossroads Communities, agricultural communities, fishing communities, urban communities, and retirement communities). Identifying community issues and problems, means of communication with the community and use of media. Community as a key stakeholder in design and planning. Methods and tools for community engagement in design and planning. Community-based management and monitoring.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Explain community architecture.
CO 2	Explain the relation of socio-cultural elements and historical background to community architecture.
CO 3	Analyze, recognize, classify, and compare special needs in community planning.
CO 4	Apply methods of community involvement as an effective way of stakeholder involvement.
CO 5	Apply co-design and participatory approaches in the design

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONAL SKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2								
CO 2	2	3							
CO 3		2				3			
CO 4		2			3				
CO 5		2			3				

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-Learning Strategy	Assessment strategy
CO1	LECTURE WITH PROJECTOR	Mid-term examination 1, Semester-end examination
CO2	LECTURE WITH PROJECTOR	Mid-term examination 1, Semester-end examination
CO3	LECTURE WITH PROJECTOR	Assignment, Presentation (Individual/Group), Semester-end examination
CO4	LECTURE WITH PROJECTOR	Mid-term examination 2, Semester-end examination
CO5	LECTURE WITH PROJECTOR	Mid-term examination 2, Semester-end examination

Books Recommended

1 Krier, Leon (2011). ***The Architecture of Community***. Island Press: London.
2 Kendig, Lane H. (2010). ***A Guide to Planning for Community Character***. Island Press: London.
3 Kelly, Eric Damian (2009). ***Community Planning: An Introduction to the Comprehensive Plan.*** Island Press: London.
4 Masterson, Jaimie Hicks et al (2014). ***Planning for Community Resilience: A Handbook for Reducing Vulnerability to Disasters***. Island Press: London.

Year/ Semester	**4th year 2nd Semester**		
Course Title	**Planning and Management for Disaster Resilience**		
Course Code	ARC 0731 4283	**Stream**	8
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

This course teaches architecture students to integrate and disaster resilience policies and technique with built environment through design and planning.

COURSE OBJECTIVES:

- To help the students to understand the causes and effects of natural calamities.
- To familiarize the students with the factors causing disaster.
- To provide an overall understanding of Disaster prevention and mitigation.
- To help them outline the concepts of disaster resistant construction.
- To expose the students to Case studies of Natural disasters in Bangladesh.
- To familiarize the students with national and international frameworks on disaster managements..

COURSE CONTENT:

Climate Change and Adaptation, Types of environmental risks and hazard in Bangladesh,Basic concept of Disaster, Hazard, Vulnerability, Capacity, Risk and Resilience; Institutionaland Regulatory aspect and framework of disaster management: Holistic Disaster Management Approach in Bangladesh, COP,Hyogo Framework, Sendai Framework, etc.Disaster Risk Reduction (DRR): Risk and vulnerabilities assessment, management, and monitoring.

Design& planning for resilience: Structural response and warning System,Earthquake: effects on buildings, Design and planning in coastal ecosystem area, Urban hazard: fire hazard, inland flooding etc. mapping techniques and responsive planning and design; Building codes, configuration and building system for fire hazard.

COURSE LEARNING OUTCOMES:

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

CO 1	Develop awareness about natural disasters and factors that causes them
CO 2	Explain the design guidelines in disaster resistant construction
CO 3	Implement solutions through adopting lessons from case studies of mitigating natural disasters in Bangladesh and mitigation policies by government
CO 4	Apply adaptive measures to encounter natural and man-made hazards
CO 5	Formulate strategies for disaster management and mitigation

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs:

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	2								
CO2	2	2							
CO3		2							
CO4						3			
CO5		2				3			

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	Mid-term examination 1, Semester-end examination
CO2	Simulation/field demonstration	Assignment, Mid-term examination 1, Semester-end examination
CO3	Lecture	Mid-term examination 2, Semester-end examination
CO4	Lecture	Mid-term examination 2, Semester-end examination
CO5	Lecture	Assignment, Semester-end examination

Books Recommended

1. Jaimie Hicks Masterson et al: Planning for Community Resilience - A Handbook for Reducing Vulnerability to Disasters, Island Press, 2014
2. Alexander Fekete, Frank Fiedrich (eds.): Urban Disaster Resilience and Security: Addressing Risks in Societies, Springer, 2018
3. Michael K Lindell: The Routledge Handbook of Urban Disaster Resilience, 2020
4. Alan March and Maria Kornakova: Urban Planning for Disaster Recovery, 2017
5. Ronald W. Perry, Michael K. Lindell: Emergency Planning (Wiley Pathways), John Wiley & Sons, 2006
6. ADPC: Handbook on Design and Construction of Housing for Flood-prone Rural Areas of Bangladesh, 2005
7. K. Iftekhar Ahmed, Salek M. Seraj: Building Safer Houses in Rural Bangladesh, 2004
8. Bashirul Haq: Battling the storm - Study on Cyclone Resistant Housing, 1999
9. Disaster Risk Reduction Approaches in Bangladesh: Rajib Shaw Fuad Mallick Aminul Islam, 2013
10. Climate Change Adaption Actions in Bangladesh: Rajib Shaw Fuad Mallick Aminul Islam, 2013
11. Design for Flooding: Architecture, Landscape, And Urban Design for Resilience to Climate Change: Donald Watson, FAIA, and Michele Adams, P.E., 2011
12. Safety Symbols Art: Camera–Ready and Disk Art for Designers:Nora Olgyay

Year/ Semester	**4th Year 2nd Semester**		
Course Title	**Construction Management**		
Course Code	CEE 0732 4211A	**Stream**	1
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

This course will familiarize the students with the basic knowledge of developing skills of understanding basic project management principles and practices. This knowledge is essential to manage projects from initiation to commissioning achieving projects' basic objectives such as time, cost, quality, and safety.

COURSE OBJECTIVES

- To introduce management tools and techniques for successful project completion
- To acquaint with project time, cost, quality, and safety management
- To make them understand project risks and uncertainties and their management strategies
- To introduce with the PMBOK and the project management manual

COURSE CONTENT

Introduction: Principles of project management and construction management, triple constraints (time-cost-quality) to achieve project goals, basic concepts of contract management, project safety and risk management.

Planning and Scheduling: Work Breakdown Structure (WBS), Gantt Chart, Critical Path Method (CPM), Program Evaluation and Review Technique (PERT), comparison and applications of CPM and PERT in various projects.

Project Delivery System and Contract Management: Basic concepts of project procurement, Project Delivery Methods: Design-Bid-Build (DBB), Design and Build, Construction Management Contract (CMC), Alliancing, Public Private Partnership (PPP),

Engineering Procurement and Contract (EPC), Build, Operate and Transfer (BOT); Contract types: Lump Sum, Unit Price, Cost Plus or Cost Reimbursable, guaranteed Maximum Price (GMP).

Project Schedule and Cost Management: Cash flow analysis, earn value management (EVM), S-curve, payback period, cost-benefit ratio, internal rate of return (IRR).
Project Quality Management: Deming's 14 points to achieve project quality, ISO 9000, Cost of Quality (CoQ), seven quality control tools, Total Quality Management (TQM), Quality Management in PMBoK.
Project Safety and Risk Management: Safety management: Safety practices at construction site from BNBC, personal and site safety, Risk management: planning for risk management, risk register, risk evaluation, risk assessment, risk control, risk residual, planning for risk response, monitoring and control risks during project execution phases.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Develop a project's plan and schedule
CO 2	Prepare cosh flow and fininancial report
CO 3	Formulate quality assurance plan and risk response strategy
CO 4	Analyze project performance and report project status to the top management

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs:

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2					2		3	
CO 2	2					2		3	
CO 3	2					2		3	
CO 4	2					2		3	

Books Recommended

1. Project Management Body of Knowledge (PMBOK)-PMI
2. Kenzer, H. (2013), Project management: a system approach to planning, scheduling, and controlling. John Wiley and Sons. ISBN-13:978-1-118-41855
3. Lewis, J.P. (2005), Project planning, scheduling, and control, 4th Ed., McGraw-Hill Pub. ISBN-13:978-0-07-146037-8
4. Gitlow, Howard S. "Quality Management" Third Edition, McGraw Hill
5. Hinze, J. W., Construction Planning & Scheduling, Essex, UK: Prentice, 3rd Ed., 2008.
6. BNBC – construction safety code chapter

Year/ Semester	**4th Year 2nd Semester**		
Course Title	**Building Maintenance and Retrofitting**		
Course Code	ARC 0732 4261	**Stream**	6
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

This course aims to teach the students building maintenance and retrofitting processes in order to enable them competent for their professional career.

COURSE OBJECTIVES

- To introduce the students with the policy and process of building maintenance.
- To help them understanding the factors and technical aspects affecting the maintenance.
- Acquaint the students with the utilization of retrofitting as a periodical solution.

COURSE CONTENT

Definition of building maintenance and building life cycle. Degradation and durability of building materials. Environmental influence of building materials. Factors affecting maintenance. Influence of design on building maintenance. Maintenance policy and guides. Building maintenance planning. Safety and economics in building operation. Operation and maintenance routines. Energy management. Organization of technical administration. Building inspection and schedule.
Retrofitting methods, analysis of retrofitting needs and possibilities, public demands and planning of retrofitting. Estimate/analyze deficiencies and retrofitting needs in the building stock. different solutions to common retrofitting problems. Seismic Strengthening and Seismic Retrofitting through architecture. Strengthening or Retrofitting Versus Reconstruction.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	Explain building cycle and identify factors affecting maintenance
CO 2	Minimize defects during construction and design
CO 3	Apply proper construction details and chose appropriate materials to make maintenance less onerous
CO 4	Maintain the performance of the building fabric and services
CO 5	Provide an efficient and acceptable operating environment to users

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs:

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	1	2							
CO2		2				3			
CO3		2				3		2	
CO4		2							
CO5					2			2	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	Mid-term examination 1, Semester-end examination
CO2	Lecture	Mid-term examination 1, Semester-end examination
CO3	Lecture	Mid-term examination 2, Semester-end examination

CO4	Lecture	Mid-term examination 2, Semester-end examination
CO5	Lecture	Assignment, Semester-end examination

Books Recommended

1. **Brian J.B. Wood**: Building Maintenance
2. **PWD Bangladesh Manual**: Maintenance management, repairs, retrofitting and strengthening of buildings.
3. **Xilin Lu**: Retrofitting Design of Building Structures
4. **BNBC 2006:** (Chapter 5)Maintenance Management, Repairs, Retrofitting and Strengthening of Buildings

Year/ Semester	**5th Year 1st Semester**		
Course Title	**Design Studio IX**		
Course Code	ARC 0731 5132	**Stream**	3
No. of Credits	6.0	**Course Hour**	12.0 hours/week

COURSE RATIONALE:

This course will ensure students to deal a complex building project in a complete practical and professional manner.

COURSE CONTENT:

Exercise on professionally comprehensive work including all design phases from formulation of architectural program to preparation of working drawings; Identifying design task to specific realistic problems; applying the existing codes and bylaws, and concentrating on the most significant contemporary environmental and professional challenges.

COURSE OBJECTIVES

- To prepare students with the practical and professional manner to deal a complex building project.
- To make students capable to analyze FAR and to prepare Project Contract Proposal for the given project.
- To develop skills to integrate project feasibility, program, architect-client ambitions and concept in a single frame with satisfaction and perfection.
- To make students capable to design following the structural and brick module to decrease investment cost for construction.
- To enable to prepare RAJUK Approval Sheet, Fire Safety Approval Sheet and Working (construction) Drawing.
- To develop student's network and communication skill to deal with multi-professionals and project management.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Design and execute a building project in a practical and professional manner
CO 2	Analyze FAR and BNBC for all types of building projects
CO 3	Illustrate the RAJUK approval sheet, authority sheets, fire safety approval sheet and project agreement paper
CO 4	Design according to the client aspiration with a practical and professional point of view
CO 5	Conduct professional apprenticeship at an architectural consultancy firm

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3							
CO 2	2	3						2	
CO 3	2	3		2					3
CO 4	2	3			3	2			
CO 5	2	3							

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Case study, FAR Analysis	Individual Presentation, Summative Assessment
CO2	Survey, Project	Continuous Assessment, Summative Assessment
CO3	Project	Continuous Assessment, Summative Assessment
CO4	Project	Continuous Assessment, Summative Assessment
CO5	Project	Summative Assessment

Books Recommended

1 Bangladesh National Building Code [BNBC]-2020
2 Imarat Nirman Bidhimala [FAR]-2008
3 Project Declaration and information Proposal
4 Professional RAJUK Approval Sheet, Fire Safety Approval Sheet, Working (construction) Drawing and Project Contract paper

Course Title	**Thesis I: Research Development**		
Course Code	ARC 0731 5192	**Stream**	9
No. of Credits	2	**Course Hour**	4.0 hours/week

COURSE RATIONALE

This is a preparatory course for developing thesis proposal of B Arch students.

COURSE OBJECTIVES

- To acquaint students with different phases of project proposal submission methods.
- To help the students to develop basic research question from a project context for further investigation.
- To enable them to develop research methods to address a thesis research question.

COURSE CONTENT

This course is the first phase of thesis stream where students will work to prepare their thesis proposal followed by adequate theoretical and physical survey. In this semester, students should go through series of individual assessments from thesis selection and research framework development. Students will be supervised by a thesis supervisor assigned by the department. At the end of this course students have to present their elaborated research proposal through thesis title defense.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Formulate the phases of thesis proposal development
CO 2	Develop a complete thesis proposal that will guide them for future thesis project
CO 3	Develop research questions from their thesis proposal
CO 4	Create the aim and objectives of the research
CO 5	Develop a work schedule for the upcoming thesis project

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2			2		3			
CO 2	2			2		3			
CO 3				2					
CO 4				2					
CO 5		2							

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	lecture, paper review	Assignment, Summative Assessment
CO2	lecture, digital presentation	Individual Presentation Summative Assessment
CO3	lecture, paper review	Assignment, Summative Assessment
CO4	lecture, paper review	Assignment, Summative Assessment
CO5	lecture, digital presentation	Individual Presentation

		Summative Assessment

Books Recommended

1 **Groat, L.N. and Wang, D**.: Architectural Research Methods
2 **London,K. and Ostwald,M**.: Architectural Research Methods
3 **Sanoff, H**.: Methods of Architectural Programming
4 **Kumar, R**.: Research Methodology.

Year/ Semester	**5th Year 1st Semester**		
Course Title	**Professional Practice I: Internship**		
Course Code	ARC 0731 5194	**Stream**	9
No. of Credits	4.0	**Course Hour**	12 weeks

COURSE RATIONALE

This course will ensure the environment for the students to work practically and professionally held at a recognized architectural consultancy farm and thus develop architectural skill, network and communication.

COURSE OBJECTIVES

- To motivate and to prepare students with the practical and professional manner.
- To make students capable to understand professionalism and management.
- To help them integrate project client dealings, design development, project management, execution and site supervision.
- To make students confident enough to take social responsibilities.
- To enable the students to take new challenges with limited resources.
- To develop student's network and communication skill to deal with multi-professionals and project management.

COURSE CONTENT

The student is required to work in an Architectural firm under an authorized Architect/s for a minimum of 12 weeks to gain practical experience. After completing app. 140 credits, a student may opt to acquire professional experience on part time basis under a member of Institute of Architects. The student shall submit a portfolio of his professional works at his convenience before final term to be evaluated by a board of examiners for a satisfactory certificate.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Develop the self attitude like a professional architect
CO 2	Build and cope up with professionalism
CO 3	Explain all necessary aspects of a building project practically and professionally
CO 4	Realize the social responsibilities, scopes and abilities of an architect keeping with Close contact off
CO 5	take forward a practical building project confidently and develop a professional network and communication skill within the industry

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL	SOCIAL SKILL	THINKING SKILL	PERSONALSKILL

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1				2					3
CO 2				2	3				
CO 3				2	3				
CO 4				2	3				
CO 5				2	3				

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-learning (TL) strategy	**Assessment Strategy**
LECTURE WITH PROJECTOR	Appreciate Students to work practically and professionally	Continuous assessment (CA)
Assignment/ Workshop	Understand to client dealings, design development, project management, execution and site supervision	Report
	Specific instructions	Viva
	Make practical knowledge/solutions to solve	Summative Assessment (SA)
		Projects/details submission

Books Recommended

1 BNBC-2006 and FAR-2008

2 Project Declaration and information Proposal, Project Contract paper Professional RAJUK Approval Sheet, Authority Drawing, Fire Safety Approval Sheet, Working (construction) Drawing, As Built Drawing

Year/ Semester	**5th Year 1st Semester**		
Course Title	**Architecture in Dialogue: Seminar**		
Course Code	ARC 0731 5196	**Stream**	9
No. of Credits	2.0	**Course Hour**	4.0 hours/week

COURSE RATIONALE:

This course intends to inculcate in the students the architectural research paper preparation and publication process.

COURSE CONTENT:

Overview of current development in research related to art and Architecture. Research and design process; Research design; Preparation of research papers including literature search, writing skills and referencing. Verbal and written presentation skills and techniques.

COURSE OBJECTIVES

- To familiarize the students with research paper writing and publication process.

- To provide the knowledge about ethics associated with the research paper writing and publication process.
- Helping them to identify and apply appropriate methods for representing the analytical data in research, both verbally and in written.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	Formulate the basic structure of research papers
CO 2	Prepare and publish a research paper
CO 3	Write research proposals, abstract and referencing in proper format
CO 4	Recognize research publication process, journals and their indexing
CO 5	Maintain professional ethics and abstain from plagiarism

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1							2		2
CO 2									3
CO 3				2			2		
CO 4				3					2
CO 5				3					

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture - research	Assessment
CO2	Article review, lecture	Assessment
CO3	Research / lecture	Assessment
CO4	Research presentation	Oral Presentation, jury
CO5	Research publication	Assessment

Books Recommended

1 Groat, L.N. and Wang, D.: Architectural Research Methods

2 London, K. and Ostwald, M.: Architectural Research Methods

3C. R. Kothari: Research Methodology

Year/ Semester	**5th Year 2nd Semester**		
Course Title	**Cost Estimation & Specification**		
Course Code	ARC 0732 5162	**Stream**	6
No. of Credits	2.0	**Course Hour**	4.0 hours/week

COURSE RATIONALE

This course aims to teach how, in relation to drawn details for building construction, to specify materials and methods of installations and precautions.

COURSE OBJECTIVES

- To introduce the students with the process of cost estimation of building construction.
- To introduce with the standards for specifications and rate schedule.
- To acquaint them with common building and finishing materials and their specifications.

COURSE CONTENT

Study of modes of measurement adopted in Bangladesh context, various methods for cost estimation of buildings. Calculation of Plinth area and cubic contents including estimation and their bases for different buildings. Calculating quantities for earth work building items, abstracting of quantities and item rate.

Definition, importance and use of specification; principles and practices, drafting of general and special specification clauses. Specification of common building materials and simple construction. Study and use of standard specification issued by engineering department in Bangladesh. Specification for special finishes, advanced/new building materials and direct construction elements

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	prepare Bill of Quotation (BOQ), detail estimation, tender drawings and documents
CO 2	identify the volume of civil works such as excavation, foundation, brickwork, casting and finishing work
CO 3	mention standard specifications in drawings properly
CO 4	calculate the estimation of interior and electro-mechanical works
CO 5	suggest environmentally resilient building and finishing materials

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1		2							2
CO 2	2				3				
CO 3	2								
CO 4	2				3			2	
CO 5						2		3	

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Project & workshop	Presentation (Group/Individual)
CO2	Field Survey & workshop	Assignment
CO3	Tutorial & workshop	Assignment
CO4	Project & workshop	Presentation (Group/Individual)
CO5	Tutorial & workshop	Presentation

Books Recommended

1. **B.N. Dutta:** Estimating and Costing
2. **P.L. Basin**: Quantity Surveying
3. **G.H. Cooper**: Building Construction and Estimating
4. **PWD Schedule – 2020**

Year/ Semester	**5th Year 1st Semester**		
Course Title	**Environmental Simulation Lab**		
Course Code	ARC 0712 5142	**Stream**	4
No. of Credits	2.0	**Course Hour**	4.0 hours/week

COURSE RATIONALE:

Simulation is the process of making a simplified model of some complex system and using it to predict the behavior of the system. In this course, state-of-the-art computer simulation methods for ventilation and thermal/energy analysis will be introduced.

COURSE CONTENT:

Introduction to the computer-based tools and techniques to assess and critically evaluate a design regarding its climatic factors. The focus of this exercise is to analyze the thermal, visual and acoustical performances of built-form, site-planning analysis, energy modelling and building performance, evaluation of energy efficiency using energy simulation software such as EnergyPlus, Ecotect, Radiance, Daysim, etc.

The course includes discussion of the benefits as well as the limitations of these tools and methods. Topics include fundamentals such as modeling strategies, underlying physical principles, understanding simulation assumptions, and interpreting results with an emphasis on developing the ability to translate the analysis into design decisions.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to
CO 1	develop a better understanding of building physics in architecture
CO 2	explore fundamental design issues such as building massing and envelope design
CO 3	conduct computerized building performance simulation for architecture
CO 4	interpret the outcome of the analysis on their own design intuition
CO 5	conduct further research and higher study in related filed

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1								3	
CO 2						2		2	
CO 3					2				

CO 4						3		3	
CO 5		2	3						

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Tutorial & workshop	Assignment
CO2	Tutorial & workshop	Assignment
CO3	Tutorial & workshop	Assignment
CO4	Tutorial & workshop	Assignment
CO5	Self study	Presentation

Books Recommended

1. **Peters B., Peters T.** (2018) Computing the Environment: Digital Design Tools for Simulation and Visualisation of Sustainable Architecture, Wiley.
2. **Garg V.**, Mathur M. (2020) Building energy simulation: a workbook using DesignBuilder, Routledge.

Year/ Semester	**5th Year 2nd Semester**		
Course Title	**Thesis II: Design Studio X**		
Course Code	ARC 0731 5232	**Stream**	3
No. of Credits	10.0	**Course Hour**	20.0 hours/week

COURSE RATIONALE:

This is a thesis by design studio. The participants in this studio will develop research-based architectural projects as a requisite for their B.Arch degree.

COURSE CONTENT:

Identification of viable development proposals as thesis projects, preparation of complete design solution based on investigation and analysis of physical and contextual aspects of the problem, deriving appropriate design considerations concerning building material, structure and form. Focus is given on the objective analysis of the related factors and in transforming these into a tangible architectural solution of professionally acceptable quality. Design exercises of realistic complexities emphasizing professional competence. Formulation of architectural programs, preparation and development of design solution through various phases, and presentation of the completed work for final evaluation.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	develop skills to address basic research questions through architectural design
CO 2	develop skills to evaluate various site and/or contextual scenarios in relation to the proposed program
CO 3	deal with broader design problems in terms of society, culture, economy and environment using extensive research methods
CO 4	demonstrate presentation skill on public level
CO 5	apply critical thinking in the process of architectural creation

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2	3							
CO 2	2	3						3	
CO 3	2	3	3			3			
CO 4	2	3							3
CO 5	2	3				3			

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching-Learning Strategy	Assessment strategy
CO1	Scheduled assessment	Design review
CO2	Scheduled assessment	Design review
CO3	Scheduled assessment	Design review
CO4	Scheduled assessment	Design review
CO5	Scheduled assessment	End-semester review
CO6	Scheduled assessment	End-semester review

Books Recommended

1. **Groat, L. and Wang, D.,** (2002)**;** *Architectural Research Methods*; John Wiley & Sons.; NY
2. **Sanoff, H..** (2018)**;** *Methods of Architectural Programming*; Routledge; NY

Year/ Semester	**5th Year 2nd Semester**		
Course Title	**Professional Practice II: Codes and Ethics**		
Course Code	ARC 0731 5291	**Stream**	9
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE:

This course is offered to the outgoing students of B.Arch. Before the beginning of their career as professional architects, this course intends to provide necessary ideas on the practice field. It is important to make them conscious of the inter-person relationship between different relevant professionals.

COURSE CONTENT:

The role of the Architect in the building industry and process; duties, responsibilities, and obligations of the Architect; general conditions of the contract; owner-Architect relationship; Architectural services; the Architect and the public; legal responsibilities of the Architect; Architects code of Conduct. Ethics.
The Architect's office; administration of construction; Competitions; the Architect and his consultants; official correspondence; professional organizations: local and international. The regulatory system: planning and design controls, building code, and approval process. Management principles and practices for the range of architectural practice.

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	explain the roles and responsibilities of an architect
CO 2	manage office and contractual systems
CO 3	follow code of conduct and ethics
CO 4	concern about regulatory and legal systems
CO 5	practice according to the accurate conception of the building codes and standards

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	2			3					
CO 2	2				3				
CO 3				3					
CO 4				3					2
CO 5	2			3					2

MAPPING COs WITH TEACHING-LEARNING & ASSESSMENT STRATEGY:

	Teaching -Learning Strategy	Assessment strategy
CO1	Lecture	Mid-term examination 1, Semester-end examination
CO2	Lecture	Mid-term examination 1, Semester-end examination
CO3	Lecture	Mid-term examination 2, Semester-end examination
CO4	Lecture	Mid-term examination 2, Semester-end examination
CO5	Lecture	Oral Presentation, Semester-end examination

Books Recommended

1. **Namavati, R.:** Principles of Professional Practice.
2. **IAB:** Code of Ethics and Professional Conduct.
3. **American Institute of Architect**: The Architecture Student's Handbook of Professional Practice.
4. Imarat Nirman Bidhimala, 2008
5. Bangladesh National Building Code (BNBC)

Course Title	**Thesis III: Dissertation**		
Course Code	ARC 0731 5292	**Stream**	9
No. of Credits	4.0	**Course Hour**	8.0 hours/week

COURSE RATIONALE

This course intends to teach the students about the preparation of report to supplement the various aspects of the thesis project of Arc 534, Design Studio X.

COURSE OBJECTIVES

- To introduce the students with the process of documentation and writing a thesis dissertation.
- To develop skills to write a thesis dissertation.
- To provide the knowledge about ethics associated with the dissertation writing process.

COURSE CONTENT

This is the third phase of thesis stream. Here students approach to report writing as a part of design effort. Preparation of report to supplement the various aspects of the thesis project of Arc 534, Design Studio X. The report should reflect the student's research in areas related of the thesis, comparative analysis and case studies. This should lead to the formation of criteria and conceptual approaches, design program and guidelines for design of the thesis in Arc 534: Design Studio X (Thesis)

COURSE LEARNING OUTCOMES:

	After successful completion of the course, students will be able to:
CO 1	outline the basic structure of a thesis dissertation
CO 2	write research proposals, abstract, research methodology, objectives and outcomes
CO 3	review case studies and relevant research articles
CO 4	apply the knowledge in writing further research papers
CO 5	maintain professional ethics and abstain from plagiarism

MAPPING COURSE LEARNING OUTCOMES (COs) WITH POs :

	FUNDAMENTAL SKILL			SOCIAL SKILL		THINKING SKILL		PERSONALSKILL	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1				2			2		3
CO 2			2	2			2		3
CO 3							2		
CO 4							2		
CO 5				3					

Books Recommended

1 **Iain Borden**: The Dissertation: An Architecture Student's Handbook, 2006
2 **Groat, L.N. and Wang, D.:** Architectural Research Methods
3 **London, K. and Ostwald, M**.: Architectural Research Methods

Non-Major Courses
(offered by Dept. of ARC for other departments)

Year/ Semester	**1st Year 2nd Semester**		
Course Title	**Computer Aided Engineering Drawing**		
Course Code	ARC 0732 1208E	**Stream**	1
No. of Credits	1.5	**Course Hour**	3.0 hours/week

COURSE RATIONALE
This course intends to train students to apply digital tools for engineering drawings and develop representation skills using computer aided software such as AutoCAD.

COURSE OBJECTIVES
- Helping the students to understand the basic knowledge of engineering drawing
- To provide the knowledge of the use of engineering drawing in the field of electrical engineering.
- Acquaint students with the basic tools of computer aided drafting using AutoCAD software.
- To help students to apply the knowledge through collaboration or teamwork.

COURSE CONTENT
Basic concepts and the use of engineering drawing in the design and manufacturing field of electrical engineering. Develop an understanding of 2D and 3D computer aided drafting with the requirements of good engineering drawings and be able to apply them to their work. Appropriate sketching exercises will be done during practice hours by using a package program namely AutoCAD.

MAPPING COURSE LEARNING OUTCOMES (CO) TO PO		**MAPPING CO TO PO**								
	After successful completion of the course, students will be able to	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
CO 1	learn the symbol of different electrical fixtures in a building	*								
CO 2	operate AutoCAD software using basic drawing commands	*		*						
CO 3	draw the electrical layout of a room			*						
CO 4	design electrical layout of a building			*	*					
CO 5	place lighting fixtures appropriately in a building			*	*					
CO 6	work as a team in different multidisciplinary projects			*				*		

Books Recommended
1. **Bernd S. Palm**: Introduction to AutoCAD 2020: 2D and 3D Design
2. **Munir Hamad**: AutoCAD 2020, Beginning and Intermediate.
3. **Pradeep Mamgain**: Autodesk 3Ds Max 2020: A Detailed Guide to Modeling, Texturing, Lighting, and Rendering, 2nd Edition.

Year/ Semester	**2nd Year 1st Semester**		
Course Title	**Computer Aided Engineering Drawing**		
Course Code	ARC 0732 2108F	**Stream**	1
No. of Credits	2.0	**Course Hour**	4.0 hours/week

COURSE RATIONALE
This course intends to train students to apply digital tools for engineering drawings in the field of food engineering and tea industry and develop representation skills using computer aided software such as AutoCAD.

COURSE OBJECTIVES
- Helping the students to understand the basic knowledge of engineering drawing
- To provide the knowledge of the use of engineering drawing in the field of food industry and spatial planning.
- Acquaint students with the basic tools of computer aided drafting using AutoCAD software.
- To help students to apply the knowledge through collaboration or teamwork.

COURSE CONTENT
Basic concepts and the use of engineering drawing in the design and manufacturing field of food engineering and tea technology. Develop an understanding of 2D and 3D computer aided drafting with the requirements of good engineering drawings and enable students to apply them in their professional works. Appropriate sketching and drawing exercises will be done during practice hours by using a package program namely AutoCAD.

MAPPING COURSE LEARNING OUTCOMES (CO) TO PO		**MAPPING CO TO PO**								
	After successful completion of the course, students will be able to	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
CO 1	learn the types of different spatial layout in food industry	*								
CO 2	operate AutoCAD software using basic drawing commands	*				*				
CO 3	draw the detail 2-D layout of an industrial building					*				
CO 4	design the basic spatial layout of a food processing and manufacturing industry					*				
CO 5	formulate appropriate zoning in a food industry design	*				*				
CO 6	work as a team in different multidisciplinary projects					*			*	

Books Recommended
1. **Bernd S. Palm**: Introduction to AutoCAD 2020: 2D and 3D Design

2. **Munir Hamad**: AutoCAD 2020, Beginning and Intermediate.
3. **Joseph De Chiara:** Time Saver Standards for Building Types
4. **Jargen Adam**: Industrial Buildings (Design Manuals)

Year/ Semester	**3rd Year 2nd Semester**		
Course Title	**Urban & Regional Planning**		
Course Code	ARC 0731 3201C	**Stream**	1
No. of Credits	2.0	**Course Hour**	2.0 hours/week

COURSE RATIONALE

The course aims to introduce the basic theory, concept and practices in physical planning through review and examination of city and regional structures since the beginning of the earliest human settlements to the contemporary, for the students of Civil and Environmental Engineering.

COURSE OBJECTIVES

- To provide the knowledge on the chronological development of cities and towns since the beginning of the earliest human settlements to the contemporary megalopolises, and beyond.
- Helping the students to understand the social-cultural and political forces that influenced the growth of the cities throughout centuries.
- Help them conceptualize basic theories in physical planning in relation to the study of built environment.
- Foster the analytical and critical thinking in understanding various physical environments in terms of their social-cultural, environmental and technological correspondents.

COURSE CONTENT

Concepts of Urban Planning: Definition, objective, scopes, trends, methods; Urban planning components: framework, forms and type of Planning; History of urbanization and planning: early to modern; Urban planning methods: Theories of zoning system.

Planning history, culture and practice in Bangladesh. Planning governance: Legislation, tools, instruments. concept of contemporary planning tools and process: Community planning, Public-Private partnership, Built-operate transfer, Transit-oriented Development.

MAPPING COURSE LEARNING OUTCOMES (CO) TO PO		**MAPPING CO TO PO**								
	After successful completion of the course, students will be able to	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
CO 1	distinguish various human settlements and identify their planning process		*							
CO 2	develop a solid conceptual framework on their origin and evolution throughout history		*							
CO 3	relate various socio-cultural, political, environmental and technological impacts to the growth of the cities throughout the globe		*							
CO 4	communicate concepts in urban history and theory through both verbal and written presentations							*		
CO 5	identify the limitations of planning and land management system in Bangladesh		*							
CO 6	apply critical thinking in a range of corresponding fields of history and theory in regional and urban planning						*			

Books Recommended

1. **Doxiadis, C.A.:** Ekistics: An Introduction to the Science of Human Settlements.
2. **Gallion, A.B. & Eisner, S.:** The Urban Pattern: City Planning and Design
3. **Hall, P.;** Urban and Regional Planning (third edition); Routledge, London; 1992
4. **Christopher Alexander, Sara Ishikawa, and Murray Silverstein**; A Pattern Language: Towns, Buildings, Construction (1976)
5. **Gary Hack, et al.** (2009) Local Planning: Contemporary Principles and Practice
6. **Professor Golam Rahman** (2008), Town planning and the political culture in Bangladesh
7. **Sultana, S**.; Rural Settlements in Bangladesh: Spatial Pattern and Development; Graphosman, Dhaka; 1993

PART D

OBE Curriculum of
Department of Architecture
Shahjalal University of Science and Technology, Sylhet, Bangladesh

12. Content of Design studios

Year 1 First year studio exercises develop craftsmanship and visual sensitivity as a foundation for a basic architectural language. Problems of various lengths deal with the technical skills of drawing and model-making materials in both two and three dimensions. Emphasis is given on idea of abstraction and creation of simple space by design thinking. Throughout Year 1, students also participate in a range of other core courses that address concerns surrounding the nature of the built environment, including Technology, History & Theory

Year 2 Second year studio develops architectural principles through the study and analysis of ergonomics, function and climate design. Studio focuses on the development of the graphic language in architecture, and considers the appropriate use form and materials.

Year 3 Third year studio continues the development of architectural principles through the correlation of design process and building systems. The studio considers the interrelations of building, programming, site planning, structure, enCOsure systems, energy consumption, and environmental control systems, and the cultural concepts supporting their organization. Design of structural system of buildings and system design for tall structures are major concerns for the studios.

Year 4 Fourth year studios focus large scale design interventions including projects like housing, urban planning and design, conservation planning, environmental planning. Students are trained to perceive design through sociological, economic, cultural dimensions and involved to address more challenging issues of society.

Year 5 In the fifth year, students enter into the thesis Studios, focused on more intensive research based design approach. Students are taught design by research method to explore design problems of large scale projects .Along with design projects student have to submit thesis dissertation to complete the thesis stream.

2. Teaching Strategy:

All teaching and supervision in department of architecture is based on the fact that the student takes responsibility for the own studies and for active knowledge gaining. The student is given the opportunity of personal development, which is of great importance for the future profession and a lifelong learning. Different teaching and working methods are applied in classes to inspire students to actively seek knowledge, to enhance critical thinking, to boost creativity and gain adequate oral and written proficiencies.

The curriculum is emphasized on design studios. Design based education requires, promotes reflection and synthesis of the fields of knowledge brought together in interdisciplinary manner. So all the taught courses are designed to support design studios. As university ordinance, Students must register for all courses they attend and want to complete. The deadlines for registration are determined prior to the beginning of the semester. Department encourage multimodal approach for design education by incorporating outdoor activities with regular classroom.

3.1 Modals for teaching strategies: *Following modes are offered by department for teaching.*

a) Design Studio

The design project is at the core of the curriculum. In the course of a project, students learn to
combine, review and assess acquired knowledge and developed ideas. The design project is taught in both individually and small group of students. Intensive one-on-one tutoring allows for responding to students' individual capacities and ideas. Team teaching is encouraged, as it confronts students and teachers with different views, incites them to think about variations and alternatives, and encourages them to take a position. Class projects are continuously reviewed and assessed in dialogue with the teachers and external guest critics. Together with the corresponding project lectures the design projects constitute modules that can only be completed as a whole.

b) Project lectures

Project lectures are thematically related with design projects and deepen knowledge concerning the issues and skills relevant to the specific project. Lectures for design studios are given inside design studio and embedded in design studio credit

c**) Theory course lectures**

Lecture courses familiarize students with the theoretical foundation and methods of architecture. Supporting teaching materials are made available by the lecturers. Students are graded on the basis of examinations on the subject matter.

d) Seminars

Seminars aim at deepening students' understanding of the subject via presentations. Students actively participate in the course through discussions, as well as written assignments and visual and oral presentations. Seminars also introduce students to research methodologies.

e) Excursions

Field trips are class excursions taking place outside school. Students are taken to historic places with architectural significances and contemporary projects sites. Students often meet the architects to know their project stories. They aim at illustrating the contents of courses in real-life contexts.

f) Internship

In department of architecture internship is a key part of teaching mode. Final year students are sent to architectural offices for one month. Students have to actively participate in at least one architectural project. After internship students are required to submit internship report documenting their works.

4. Assessment Strategy:

A variety of examination formats are applied in the program courses. The format is adapted to the different course requirements on examination formats. Students' performance is continuously evaluated through Jury presentation, projects, examination, oral test and periodic assessments of sessional work. The design, extent and duration of the tests are adapted to the learning outcomes decided for the respective course. Classes are subject to continuous review and assessment of progress by teachers. The class test mode and the conditions are determined by teachers at the beginning of the semester. Students have to register for exams and collect admit card to. Department of architecture adopted following modes of assessment strategies to evaluate students learning outcome.

Jury presentation
Jury presentation is one of the major assessment strategies of Architecture department. Students have to present his/her final design outcome inform of a Jury board consisting of both studio and external teachers. Out of campus professionals and visiting academics are invited to be a part of Jury very often.

Periodic Design Assessment
Periodic design assessments monitor design development phases inside class. Class teacher assess project development and give instructions. Part of total course grade is assigned for assessments.

Class Presentation
Students are often required to make classroom presentations to verbalize their knowledge and organize their thoughts about a topic in order to present a summary of their learning. It provides the basis for assessment upon completion of a student's project.

Written Examination
Written examinations for theory courses are important assessment strategy for architecture department. Examinations require students to given questions to demonstrate their knowledge of theory courses. At the end of the semester, students have to attend semester final examination. This is a written examination where students need to answer course related question with in a given time.

Class test /Quiz
Class test and Quizzes are usually short examination for theory courses taken in middle of the semester.

Portfolio Submission
A portfolio is a collection of samples of a student's work as a visual demonstration of a student's achievement. Students are required to submit design portfolio after semester.

Report Writing
A report is a writing sample in which a student constructs a response to a question, topic, or brief statement, and supplies supporting details or arguments. Students are required to submit reports as design survey outcome. Topics of the reports usually follow the learning objective of respective course. Report is an essential part of final year thesis where student have to submit report as a thesis dissertation along with design project.

Physical Model Making/ Graphical reproduction
Varies with courses, students are often required to submit either physical models or graphical reproductions in form of photographs, posters.

Self-assessment
Self-assessment is a process by which the students gather information about their own learning. It is the student's own assessment of personal progress in terms of knowledge, skills, and processes. Self-assessment is encouraged among students to develop critical thinking on own work and monitor working progress.

Class Performance
As university ordinance, Class attendance assessment is a key part of student assessment for every courses. Call attendance records are taken by so responding teachers and a grade is awarded for this. For theory courses students have to attend at least 50 % of the course lectures to be eligible to take part in the final exam.

Code	Teaching-learning (TL) strategy	Code	Assessment Strategy
LECTURE WITH PROJECTOR	Lecture using board/LCD projectors/OHP projectors		Continuous assessment (CA)
TL 02	Class discussion/seminar/tutorial	CA 01	Midterm Examination 01
TL 03	Self-learning using reference book/research article/case	CA 02	Midterm Examination 02

	study/other online materials		
TL 04	Student-led classroom - Students team teach or work in groups to teach a new topic.	CA 03	Assignment 01
		CA 04	Assignment 02
			Summative Assessment (SA)
		SA 01	Semester-end examination

4.1 Assessment Policy for Theory Courses

Course Type	Assessment Strategy	Class Attendance	Class Perform	Class Test	Final Examination
Theory Courses.	Class Performance Class test Quiz Assignment presentation Written examination Viva/Voc	**10%**	**10%**	**20%**	**60%**

4.2 Assessment Policy for Design Studios

Teachers are assigned for each semester at the beginning of semester. Project section, studio organization and grading parameter are set and revised by the Design Coordinator and respective studio teachers. The Final Project grading is divided into 3 Periodic assessment and Jury presentation. Class teacher will ensure following requirements for periodic assessment:

1. Schematic Review (review of concept, site analysis, program, etc.)
2. Design Development (review of project, architectural plans and sections, structure, functional distribution, program development, etc)
3. Final Review

The Jury board consists of class teachers and external members. Jury board for each studio is suggested by design coordinator and approved by department in the beginning of each semester. From 2nd year to 5th year each studio is required to exercise at least two projects. Project grades will be cumulated according to project duration weightage and determined by studio teacher.

Course Type	Assessment Strategy	Class Attendance	Periodic Assessment	Final Jury/ Presentation
Design Studio	Jury Presentation Preliminary Assessment Reports Design Portfolio Model Making Self-Assessment	**10%**	**50%**	**40%**
Sessional Studio	Jury Presentation Preliminary Assessment Reports Design Portfolio Model Making Self-Assessment	**10%**	**50%**	**40%**

4.3 Thesis

Thesis is a requirement for B arch degree in department of architecture. Every student prepares thesis proposal and develop along the semester and present it. Department encourages both thesis by project and thesis by research. Thesis proposal have to be approved by department at the beginning of the semester. Each student develops their thesis inside studio under the supervision of class teachers. The thesis shall be submitted in the form of Design project, Research, Report, Drawings, Models etc. The thesis covers in two semesters distributed in three following phases:

Phase	Activity	Semester	Credits
Thesis I	Development and submission of research proposal.	5-1	2
Thesis II	Thesis design Studio	5-2	10
Thesis III	Dissertation	5-2	4

The evaluation of the thesis is guided through sessional and dissertation evaluation. The sessional work made up of various stages, will be evaluated through periodic assessment and by a jury comprising the class teachers and

external examiner. The dissertation is evaluated by corresponding dissertation course teacher and design studio teachers.

Thesis design studio Grading criteria

	Review 01	Review 02	Pre-jury	Jury	Total
Thesis Supervisor	5	5	10	10	30
Thesis Committee	5	5	10	20	40
External Jury	x	x	x	30	30
	10	10	20	60	100

Dissertation Grading criteria

Research Development			Dissertation Writing				
Literature review /Background Theory	Research Method/Analysis/Finding	Schematic Design Process	Content	Text Format	References/Bibliography	Performance during supervision / overall quality	TOTAL
25	**25**	**25**	**5**	**5**	**10**	**5**	**100**

4.4 Internship

During the semester the students are required to undergo practical training of 4 weeks. Every student is required to submit copies of representative work done and study report during this period together with a certificate from the Organization to the Department of B. Arch. The practical training work is evaluated, through seminar/viva-voce by corresponding teacher.

4.5 Grading System

The University Grading System uses a series of letters to which grade quality points are assigned. The Grade Point Average (GPA) is calculated according to a procedure. Each grade represents a level of performance as indicated below.

Marks (100)	Grade	Grade Point
80% or above	A+ (A plus)	4.00
75% to less than 80%	A (A regular)	3.75
70% to less than 75%	A- (A minus)	3.50
65% to less than 70%	B+ (B plus)	3.25
60% to less than 65%	B (B regular)	3.00
55% to less than 60%	B- (B minus)	2.75
50% to less than 55%	C+ (C plus)	2.50
45% to less than 50%	C (C regular)	2.25
40% to less than 45%	D	2.00
Less than 40%	F	0.00

4.6 Grade Point Average (GPA)

All courses taken by a student are included in the computation of the cumulative Grade Point Average. The Grade Point Average is the ratio of the number of points gained, to the number of credit hours attempted. The semester GPA = Total semester quality points/Total semester credit hours attempted.

4.7 Code of Conduct During Examination

Students are expected to abide by the Code of Conduct during all the Examinations as university rules

4.8 Degree Requirement for B Arch program

4.9 Awarding Degree Certificates

Students who fulfill the requirements for a higher education qualification should receive degree certificates. With each degree certificate, a transcript supplement describing the individual course results will be awarded.

5. Graduate Profile

Architecture is always one of the strongest symbols to search the history and it made the world suitable for human being to survive till date. With these dignities of architecture, we try to ensure those qualities among our graduates that made them fittest to survive locally as well as globally. The

architectural is fast demanding professional field due to accommodate livings for high dense population and rapid growth in urban and sub urban areas in Bangladesh. To meet these challenges and demand of the society our graduates are individually capable to serve the social needs with creative environment responsive livable design and policies for all professionally and ethically.

The Architecture department is providing five years Bachelor of Architecture degree here. In the meantime, the department has released eight batches of around more than two hundred graduates within thirteen years of time span.

All are serving the society by being practicing architects, entrepreneurs and developers and also being involved in teaching professions, government jobs and research projects and so on successfully. Their skills regarding intellectuality, practical projects, numeracy, analytical ability, research works and innovations are highly appreciated by the stakeholders by this time period. Our graduates have already made a strong platform and acceptance within the society.

The graduates are showing an unbeatable performance among the practicing market with their unparalleled IT, communication, interpersonal relationship, leadership and teamwork skills. They are able enough to run new businesses with related issues, innovative ideas and techniques, introducing unique use of products to serve the community. They are well behaved and skilled to communicate effectively with colleagues, clients and different service providers for the best outcome. Our graduates are able to understand and to carry professionalism, managerial and leadership responsibilities, entrepreneurship, problem-solving context, self-management activities. They have already been proven in demonstrating strong analytical and problem-solving skills. They do a rational judgment for a practical solution with a detailed work in depth with sensitivity from the available and given information. They have ability to visualize, articulate and conceptualize solutions for any problems by making sensible decisions.

They have achieved the qualities within the five-year frame of social and cooperative, values, attitudes and awareness. They always ensure commitment to independent learning and confirming adequate research skills to collect and analyze information obtained from different source from the ethical practice in the field upholding the moral of the profession. Moreover, they maximize ability to adjust with the needs continuous changes of a rapidly evolving society. They are able to improve self-confidence through rational judgment by accepting constructive criticism.

They are able to work with a passion, sensitive and spirit of culture and heritage of a region as well as the nation. They are contributing the society by satisfying the clients with their sensitive, innovative, livable, iconic development works with high criticism.