Outcome-based Curriculum of Master of Architecture

Architecture Discipline
Khulna University

September, 2022

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01. Title of the Academic Program

Master of Architecture

Program Overview	
Degree	Master of Architecture
Abbreviated form of the Degree	M.Arch
Major (if applicable)	N/A
Discipline/Program Offering Entity (POE)	Architecture Discipline
School	Science, Engineering, and Technology School
Awarding Institution	Khulna University
Location	Khulna, Bangladesh
Bangladesh National Qualifications Framework (BNQF) Level	9
International Standard Classification of Education (ISCED) Code	0731
Mode of Study	Mixed-mode (Dissertation)
Language of Study	English
Applicable Session	2022-2023 and onwards

02. Name of the University

Khulna University

03. Vision of the University

Creation of global leaders who will contribute to make knowledge-based just society through accelerating inclusive and transformative growth of Bangladesh and the world. The university aims to achieve this vision through scholarly enquiry and contribution to the global knowledge pool.

04. Mission of the University

No of UM	Brief of UM
UM1	Explore human potential to the fullest extent and produce self-motivated, aspiring leaders to work for the betterment of the humankind based on wisdom, freethinking, creativity and unhindered intellectual exercises.
UM2	Ensure a transformative educational experience that enables creative learning, entrepreneurship and inquisitiveness among the students.
UM3	Create an inclusive research environment that enables graduates to make demonstrable economic and social impacts through translating knowledge and innovation into practice driven by moral values and professional ethics.

UM = University Mission

05. Name of the Discipline/Program Offering Entity (POE)

Architecture Discipline (ArchKU)

06. Vision of the Discipline/POE

ArchKU aspires to become a centre of academic excellence in producing graduates who would advocate moral values, context, inquiry and research, problem-solving, synthesis, leadership, and lifelong learning in creating a healthy built environment while addressing the emerging needs and challenges of societies.

07. Mission of the Discipline/POE

No of M	Brief of M
M1	To enable a buoyant, adaptive and thought-provoking learning environment that supports inclusiveness, critical thinking, creativity, innovation and experiment, while problematizing the unique cultural landscape of Bangladesh.
M2	To equip students with necessary knowledge, sensitivity, skills, and attitudes to design buildings and settlements that would warrant sustainability and wellbeing through rigorous and interdisciplinary exchange between emerging discourses and practices.
M3	To produce skilled and committed professionals with a strong contextual foundation, who should become leaders in local and global premises, pioneer diversified career paths and yield novel design approaches/thinking/methodologies to tackle the socio-environmental needs and challenges posed by the contingent and changing world.

M = Mission of the Discipline/POE

08. Objectives of the Discipline/POE

No of O	Brief of O
O1	To enable a thought-provoking learning environment that is founded on critical inquiry, innovation, and experimentation, while prioritizing the unique cultural landscape of Bangladesh.
O2	To educate students with contextual knowledge, responsiveness, professional skills, and attitudes in designing buildings and cities that would ensure health, safet,y and sustainability ascertained by rigorous interdisciplinary exchange between emerging discourses, practices and socio-environmental needs, aspirations and challenges.
O3	To produce skilled and committed professionals with a solid contextual foundation, who could act as leaders and team players, pioneer diversified career paths, and yield novel design approaches, thinking, and methodologies to tackle the challenges posed by the contingent and changing world.

O = Objective of the Discipline/POE

09. Name of the Degree

Master of Architecture

10. Description of the Program

The Master of Architecture is a post-professional graduate program offered by Architecture Discipline, Khulna University. It promotes advanced level design research across several disciplinary specializations and adopts both “Learning by doing” and “Design by Research” approaches. In the context of global architectural practice, the course is committed to the development of international perspectives both in terms of the curriculum and research-based components, and in terms of the learning process itself. This course has been designed to assume an interactive learning process that encourages and enables the sharing of international and cultural experiences to deepen and enrich learners’ understanding, and equip them to respond appropriately to different design contexts. This program trains professionals, using a combination of emerging philosophies, advanced knowledge, cutting edge skills and critical inquiry toward the production of sensible but forward looking architecture. It should make learners capable of thinking out of the box and produce architectural solutions for the current and imminent problems

of the environment and society, while challenging the linear and homogeneous approach in design and building.

The program prepares students for an entrepreneurial approach to architectural thinking and practice. Students are exposed to the possibility to create their own practice in the field of architecture, urban design, landscape design, and other relevant fields. Students who graduate successfully from this M. Arch course will also have an opportunity to undertake a research degree, preferably a Doctor of Philosophy (PhD).

11. Graduate Attributes

No.	Graduate Attributes	Multiple Domains
GA1	Deep Discipline Knowledge and Intellectual breadth	Fundamental domain + Thinking domain
GA2	Digital Capabilities	Fundamental domain + Personal domain
GA3	Team works and communication skills	Social domain + Personal domain
GA4	Cultural competency	Social domain + Personal domain + Thinking domain
GA5	Creative and critical thinking and problem-solving	Fundamental domain + Personal domain+ Thinking domain
GA6	Decision-making and Entrepreneurship	Thinking domain + Personal domain
GA7	Self-awareness and Ethical competency	Personal domain + Social domain
GA8	Professionalism and leadership readiness	Personal domain + Social domain

GA = Graduate Attributes

12. Program Educational Objectives (PEOs)

No of PEO	Brief of PEO	Domain
PEO1	To instill advanced knowledge of the philosophies and principles of design in architecture, and their relationship with humans and the multifarious aspects of the (built) environment at large.	Fundamental

PEO2	To frame appropriate methodologies, often using multi-disciplinary concepts and frameworks, to address complex architectural issues and meet specific design needs of communities.	Fundamental + Thinking
PEO3	To educate students on disseminating design, methodologies, processes and research findings using advanced and emerging communication techniques complying the highest professional standards.	Thinking+ Personal
PEO4	To provide knowledge-driven services to fulfil the needs of society and the building industry through the provisioning of hands-on experience in various technologies in architecture and its allied fields.	Social
PEO5	To inculcate the capacity to leadership, teamwork, management and influence organizations and communities toward their wellbeing.	Personal

PEO = Program Educational Objective

13. Program Learning Outcomes (PLOs)

After successful completion of the degree, the learner will be able to:

A. Fundamental Skills	
PLO1	Understand philosophy, environment, technology and society in relation to architectural practice and research (in areas such as buildings, urban studies, conservation, disaster resilience etc.) and apply professionally and academically.
PLO2	Seek and apply appropriate spatial and digital tools – quantitative, qualitative, and mixed methods, in the investigation and design of buildings.
B. Social Skills	
PLO3	Write academic and professional reports, conduct project documentation, make effective presentations, and give and receive clear instructions to communicate effectively with acadmics, professionals and society at large.
PLO4	Collaborate, communicate and consult with communities alongside professionals and stakeholders to improve the quality of life and enhance wellbeing.
PLO5	Logically assess societal, health, safety, legal and cultural issues informed by contextual knowledge and professional standards relevant to the practice of architecture.
C. Thinking Skills	

PLO6	Use evidence-based knowledge and fieldworks for the analysis, interpretation, and synthesis of data/information to produce reliable conclusions while applying critical thinking.
PLO7	Establish, administer and run an enterprise successfully being an innovator with new ideas for the profession.
D. Personal Skills	
PLO8	Recognize the need for, and have necessary preparation and ability to engage with independent and lifelong learning in the broadest context of technological, socio-cultural and environmental change.
PLO9	Commit to professional ethics and by learning about ethical principles and responsibilities, and norms of professional practice.
PLO10	Function effectively as an individual, and as a member or leader in diverse teams in multidisciplinary environs.

PLO = Program Learning Outcome

14 (A). Mapping Mission of the University with PEOs

Missions / PEOs	UM1	UM2	UM3
PEO1	3	2	1
PEO2	1	1	3
PEO3	2	2	3
PEO4	1	3	1
PEO5	2	1	3

Level of Association: 3=High, 2=Medium, 1=Low

14(B). Mapping Mission of the Discipline with PEOs

Missions / PEOs	M1	M2	M3
PEO1	3	2	1
PEO2	1	1	3
PEO3	2	2	3
PEO4	1	3	1
PEO5	2	1	3

Level of Association: 3=High, 2=Medium, 1=Low

15. Mapping PLOs with PEOs

Program Learning Outcomes (PLOs)		Program Educational Objectives (PEOs)				
		PEO1	**PEO2**	**PEO3**	**PEO4**	**PEO5**
A. Fundamental Domain	PLO1	●			●	
	PLO2		●	●		
B. Social Domain	PLO3			●	●	●
	PLO4		●	●	●	●
	PLO5	●	●	●	●	
C. Thinking Domain	PLO6	●	●			
	PLO7			●	●	●
D. Personal Domain	PLO8	●				●
	PLO9				●	●
	PLO10			●	●	●

16. Mapping Courses with PLOs

Course Code and Course Title	PLOs									
	Fundamental Domain		**Social Domain**			**Thinking Domain**		**Personal Domain**		
	PLO 1	PLO 2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
First Year First Term										
0731 01 Arch 6101 Architectural History, Theory and Criticism	●	●	●		●	●				
0731 01 Arch 6102 Design Communication		●	●			●	●	●		●
0731 01 Arch 6138 Computational Design	●	●				●	●		●	
0319 01 Soc 6153 Research Methodology	●	●	●	●	●	●		●		
Courses for Elective 1 and Elective II (First Year First Term)										
0731 01 Arch 6131 Building Performance Evaluation	●	●	●	●	●	●		●		●
0731 01 Arch 6137 Housing: Policies	●	●	●	●	●	●		●	●	●

and Finance										
0288 01 Arch 6141 Conservation: Principle, Practice and Management	●			●		●		●		●
0732 01 CE 6171 Advanced Structural System	●	●				●		●	●	
0188 01 Edu 6171 Architecture Education: Concepts and Practices	●	●		●	●	●	●	●		●

Course Code and Course Title	**PLOs**									
	Fundamental Domain		**Social Domain**			**Thinking Domain**		**Personal Domain**		
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO 8	PLO 9	PLO1 0
First Year Second Term										
0731 01 Arch 6200 Dissertation Part-I	●	●	●			●		●		●
0731 01 Arch 6202 Advanced Design Studio	●	●	●	●	●	●		●		●
0532 01 Geog 6270 Spatial Data-analysis lab	●	●				●	●			●
Courses for Elective 1II and Elective 1V (First year Secod Term)										
0731 01 Arch 6231 Regenerative Design	●	●	●	●	●	●		●		
0731 01 Arch 6233 Water Sensitive Design	●	●	●	●		●		●	●	
0288 01 Arch 6241 Heritage Conservation and Digital Technologies	●	●	●			●		●		●

0731 01 Arch 6243 Advanced Construction Technology	●	●		●	●	●		●	●	●
0031 01 Arch 6245 Individual Study Module (ISM)	●	●	●	●	●	●		●	●	●
0731 01 URP 6271 Rural-Urban Settlement System	●	●		●	●	●				

Course Code and Course Title	**PLOs**									
	Fundamental Domain		**Social Domain**			**Thinking Domain**		**Personal Domain**		
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
Second Year First Term										
0731 01 Arch 7100 Dissertation Part-II		●	●					●		
0731 01 Arch 7108 Thesis Colloquium		●	●	●		●		●	●	●

17. Structure of the Curriculum

a) Duration of the Program	1.5 years	03 terms
b) Admission Requirements	Students who are passionate about combining design and science to lead the future of the built environment, and want to use algorithms, digital data and smart materials approach for prototyping and accelerating contribute to new novel building and innovation building solutions, are particularly welcome to join this M. Arch program. Candidates seeking admission into this program must possess a Bachelor degree in Architecture or allied disciplines (Minimum CGPA 2.5 out of 4/ or 2nd class) from a a recognized university (home and abroad); with 16 years schooling; and a minimum CGPA/ class/ division as per the table no 4 in the ordinance for master's programs-2022. Other terms and conditions are set or revised periodically by the appropriate authority subject to the approval of EC, BOAS, and AC of Khulna University. Candidates seeking admission into 'Master's by Research' program must have (i) either 'thesis' or similar type of course(s) in Bachelor degree or (ii) publish at least one article in a reputed journal as the first author. Students having an 'Appeared' Certificate of her/his Bachelor degree may be admitted in the M. Arch program. But she/he must submit the original Transcript, Provisional Certificate/Migration Certificate etc. of the	

	Bachelor degree within two months of admission. Otherwise her/his admission will be cancelled.
c1) Graduating Credits / Total Minimum Credit Requirement to Complete the Program[i]	48
c2) Available Credits	54
d) Total Class Weeks in a Term[ii]	14
e) Minimum CGPA Requirements for Graduation	2.50
f) Maximum Academic Years of Completion	03 years

Program type	**Min. credit requirement from major area**[i]			
	Coursework (Min.)	**Dissertation (Min.)**	**Dissertation (Max.)**	**Min. from Major Area**
Mixed-mode (Dissertation)	28	20	-	-

Term Duration[ii]				
Teaching and Learning	**Preparatory Leave**	**Term Final Examination**	**Term Break**	**Total**
14 Weeks	2 Weeks	4 Weeks	2 Weeks	22 Weeks

g1) Area-wise Credit Distribution

Area	**Course Type**	**Number of Courses**	**Credits**	**Total Credits**
General Education (GED) Courses**	Theory	3	09	09
	Sessional	0	0	
Core/Compulsory Courses	Theory	2	6	36
	Sessional	5	30	
Optional/Elective Courses	Theory	4	12	18
	Sessional	2	06	
Capstone Courses***	Sessional	3	20	20
Total		**13**	**54**	**54**

**16.66 % from GED courses

***Thesis, project, internship etc.

18. Year/Term-wise Distribution of Courses

First Year First Term							
				Contact Hours/Week			

g2) Category of Courses

Area	Course Type	Course Title	Credits
General Education (GED) Courses	Theory	1) Research Methodology 2) Individual Study Module (ISM) 3) Architectural Education: Concepts and Practices	9
Core/ Compulsory Courses	Theory	1) Research Methodology 2) Architectural Thinking and Criticism	06
	Sessional	1) Design Communication 2) Advanced Design Studio 3) Dissertation Part-I 4) Dissertation Part-II 5) Thesis Colloquium	30
Optional/ Elective Courses	Theory	1) Elective I 2) Elective II 3) Elective III 4) Elective IV	12
	Sessional	1) Computational Design 2) Spatial Data Analysis	06
Capstone Courses	Sessional	1) Dissertation Part-I 2) Dissertation Part-II 3) Thesis Colloquium	20
Total			**54**

				Theory	**Sessional**		
	0731 01 Arch 6101	Architectural History, Theory and Criticism	Core	3.0	-	3.0	None
	0731 01 Arch 6102	Design Communication	Core	-	6.0	4.0	None
	0319 01 Soc 6153	Research Methodology	Core	3.0	-	3.0	None
	Term Total Core			**6.0**	**6.0**	**10.0**	-
Optional Courses	-	Elective I*	Optional	3.0	-	3.0	None
	-	Elective II*	Optional	3.0	-	3.0	None
	0731 01 Arch 6138	Computational Design	Optional	-	4.5	3.0	None
	Term Total Optional			**6.0**	**4.5**	**9.0**	-

Course	**Course Title**	**Course**	**Credits**	**Prerequisites**

Total	Core Courses:03, Optional Courses: 03, Theory Courses: 04, Sessional Courses: 02	12	10.5	**19.0**	-
		22.5			

First Year Second Term							
	Course Code	**Course Title**	**Course Status**	**Contact Hours/Week**		**Credits**	**Prerequisites**
				Theory	**Sessional**		
Core Courses	0731 01 Arch 6200	Dissertation Part-I	Core	-	6.0	4.0	None
	0731 01 Arch 6202	Advanced Design Studio	Core	-	9.0	6.0	Yes
	Term Total Core			-	**15**	**10**	-
Optional Courses	-	Elective III**	Optional	3.0	-	3.0	None
	-	Elective IV**	Optional	3.0		3.0	None
	0532 01 Geog 6270	Spatial Data-analysis lab	Optional	-	4.5	3.0	None
	Term Total Optional			**6.0**	**4.5**	**9.0**	-
Total	Core Courses:02, Optional Courses: 03, Theory Courses: 02, Sessional Courses: 03			6.0	19.5	**19.0**	-
				25.5			

Second Year First Term							
	Course Code	**Course Title**	**Course Status**	**Contact Hours/Week**		**Credits**	**Prerequisites**
				Theory	**Sessional**		
Core Courses	0731 01 Arch 7100	Dissertation Part-II	Core	-	18.0	12.0	Yes
	0731 01 Arch 7108	Thesis Colloquium	Core	-	6.0	4.0	Yes
Total	Core Courses:02, Optional Courses: 00, Theory Courses: 00, Sessional Courses: 02			-	24.0	**16.0**	-
				24.0			

***List of offered optional theory courses for Electives I and II**

Course Code	**Course Title**
0731 01 Arch 6131	Building Performance Evaluation
0731 01 Arch 6137	Housing: Policies and Finance
0288 01 Arch 6141	Conservation: Principle, Practice and Management

0732 01 CE 6171	Advanced Structural System
0188 01 Edu 6171	Architecture Education: Concepts and Practices

****List of offered optional theory courses for Electives III and IV**

Course Code	Course Title
0731 01 Arch 6231	Regenerative Design
0731 01 Arch 6233	Water Sensitive Design
0288 01 Arch 6241	Heritage Conservation and Digital Technologies
0731 01 Arch 6243	Advanced Construction Technology: Fabrication and Material
0731 01 Arch 6245	Individual Study Module (ISM)
0731 01 URP 6271	Rural-Urban Settlement System

Note: Elective Theory courses to be taken from any specialization stream without repetition and subject to approval of the adviser.

19. Course Description

First Year First Term

Course Code: 0731 01 Arch 6101	**Year:** First	**Term:** First
Course Title: Architecture: History, Theory, and Criticism		
Course Status: Core		
Credit: 3.0		
Prerequisite(s): None		
Rationale	This course provides the necessary understanding of the precedence and context of architectural design and the evaluative skills to not only improve on the past but to engage in constructive dialogue for the present and future. It imparts a sense of judgment, and introduces them to the methods of design criticism to facilitate a critical appraisal of the design process (e.g. context, conceptualization, contextualization, and reasoning concerning realizing/making/building). With an explicit grounding in the history of architecture and its allied disciplines, the course expands students' knowledge and abilities to understand, discuss and critically evaluate design works and strategies.	
Objectives	1. Value history, theory and criticism as an essential and profoundly correlated triad in architectural thinking and practice 2. Situate architectural design, construction and materiality in the context of the socio-technical climate of the past 3. Appraise the historical role of theory in shaping the thinking and practice in the discipline of architecture 4. Prepare for the comprehension, evaluation and production of architectural theory and criticism	

Course Contents	CLOs
Section A	

1	Contextualizing history-theory-criticism	1
2	History of the theory in/of architecture	1, 2
3	Theory in the history of architecture	1, 2
Section B		**CLOs**
1	Role of criticism in architecture	1
2	Context (site/forum), presentation, voice, vocabulary, audience, and objectivity of architectural/design criticism	2, 3
3	Approach, medium, and methods of architectural/design criticism	4

	Upon completion of this course the students will be able to:		**Mapping with PLOs**
Course Learning Outcomes (CLOs)	CLO1	Appraise the creative/synthetic nature of criticism	1
	CLO2	Apply various methods of architectural criticism in relation to history and theory of architecture	5, 6
	CLO3	Evaluate contemporary design problems against historical and theoretical discourses on architecture	1, 2, 6
	CLO4	Comprehend, produce and evaluate critical writings	1, 3

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Lecture & Peer group discussion/activity	Group Presentation & Final Examination
CLO2	Lecture & Peer group discussion/activity	Peer assessment
CLO3	Lecture & Field/architectural site visit	Poster Presentation & Final Exam
CLO4	Lecture (with few guest lectures) & Class exercise (peer groups) on reading/writing techniques	Independent write up & Peer critiquing

Learning Materials	
Recommended Readings	1. Crysler, C. G., Cairns, S., and Heynen, H. (Eds.). (2012). The SAGE *handbook of architectural theory*. Sage. 2. Hartoonian G. (2017). *Time, History, and Architecture. Essays on Critical Historiography*, Routledge 3. Mallgrave H. F.(Ed.) (2006). Architectural Theory (Vol. I). *An Anthology from Vitruvius to 1870*. Blackwell 4. Goodman, D. J., and Mallgrave, H. F. (2011). An introduction to architectural theory: 1968 to the present. John Wiley and Sons. 5. Oh, Y. (2010). Toward A Theory of Design Critiquing-The Furniture Design Critic Program (Doctoral dissertation, Carnegie Mellon University). 6. Rendell, J., Hill, J., Dorrian, M., and Fraser, M. (Eds.). (2007). Critical architecture (Vol. 1). Routledge.

	7. Twemlow A. (2017). Sifting the Trash, The MIT Press
Supplementary Readings	1. Hays, K. M. (1984). Critical architecture: Between culture and form. Perspecta, 21, 15-29. 2. Heynen H. (1999). Architecture and modernity: a critique. MIT Press 3. Lang, J., and Moleski, W. (2016). Functionalism revisited: architectural theory and practice and the behavioral sciences. Routledge. 4. Leach N. (ed.) (1997). *Rethinking Architecture. A reader in cultural theory*. Routledge 5. Plowright P. D. (2014). *Revealing Architectural Design Methods, Frameworks and Tools*. Routledge 6. Raman P. G. and R. Coyne (2000). The Production of Architectural Criticism, Architectural Theory Review. *Journal of the Department of Architecture, Planning and Allied Arts*. Vol. 5(1), pp 83-103 7. Rendell J. (2005). Critical architecture: Introduction. *The Journal of Architecture*, Vol. 10(3), pp. 227-228 8. Smith K. (ed.) (2012). *Introducing Architectural Theory. Debating A Discipline.* Routledge

Course Code: 0731 01 Arch 6102	**Year:** First	**Term:** First
Course Title: Design Communication		
Course Status: Core		
Credit: 4.0		
Prerequisite(s): None		

Rationale	This course introduces architectural design processes and representation methods through planned and systematic collaboration. It orients, using hands-on methodology and precedents, to contemporary and emerging inquiry tools, schematics/optioneering, synthesis and design, criticism and development, presentation/visualization, and production that describe an entire spectrum of an architectural project in depth and detail.
Course Objectives	1. Provide knowledge of contemporary and emerging processes and representational methods in architectural design. 2. Instill the ability to gather information, define problems, analyze and critically judge, and formulate strategies for continuous design development in a professional manner. 3. Instill the ability to explore, develop, define and communicate design through collaboration, speaking, numeracy, writing, drawing, and modeling.

	Course Contents/Tasks	**CLOs**
1	Conceptualization of design process in diverse contexts and their application in architectural design development and production.	1, 2
2	Process of inquiry; analysis and synthesis; verbal, and written presentation on/in architecture.	3
3	Hands-on exercise/experiment with contemporary and advanced methods of visualization and representation (manual, electronic, graphical).	1, 2, 3
4	Site visits to appreciate the multiplicities and challenges of communication for materializing concepts in real-life situations..	4
5	Collaboration with professional/industry enterprises using state-of-the-art techniques.	1, 2

	Upon completion of this course the students will be able to:		**Mapping with PLOs**
Course Learning Outcomes (CLOs)	CLO1	Demonstrate skills in contemporary and emerging design processes and representational methods in addressing an architectural problem.	2, 3, 7
	CLO2	Collect information, define problems, analyze and critically judge, and formulate strategies for continuous design development.	3, 6

	CLO3	Acquire professional-level proficiency in a variety of communication techniques: traditional, electronic, and experimental.	8
	CLO4	Select appropriate tools and techniques to deal with the particular nature of the problem.	2, 10

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Lectures and hands-on workshops	Desk critiques, studio pin-ups, and mid-term and final reviews
CLO2	Skill-based tutorials and problem-based learning	Desk critiques, studio pin-ups, and mid-term and final reviews
CLO3	Individual and Team Work	Desk critiques, studio pin-ups, and mid-term and final reviews
CLO4	Hands-on workshops	Desk critiques, studio pin-ups, and mid-term and final reviews

Learning Materials	
Recommended Readings	1. Frascara, J., (2004). Communication Design – Principles, Design and Practice. Allworth Press. 2. Davis, M., and Hunt, J. (2017). Visual communication design: An introduction to design concepts in everyday experience. Bloomsbury Publishing..
Supplementary Readings	1. Sherwin, D. (2010). *Creative workshop: 80 challenges to sharpen your design skills*. How Books. 2. Zimmerman, J., Forlizzi, J., and Evenson, S. (2007). Research through design as a method for interaction design research in HCI. In *Proceedings of the SIGCHI conference on Human factors in computing systems* (pp. 493-502).

Course Code: 0731 01 Arch 6138	**Year:** First	**Term:** First
Course Title: Computational Design		
Course Status: Optional		
Credit: 3.0		
Prerequisite(s): None		

Rationale	This course improves traditional design processes/methods by encoding design decisions using advanced computing. It contains methods adapted from allied technological fields, namely computer science, mathematics, and applied geometry, to address design problems. The course suits the students interested in pushing disciplinary boundaries, developing a unique design research agenda, and acquiring the necessary technical competence to explore computational design at the highest level of creativity and scholarly rigour.
Objectives	1. Understand the potential of computation and its role in the design process, not merely as a collection of tools but as a way of thinking about design. 2. Enable algorithmic thinking by being able to use computer programming and applications for exploring, optioneering, developing, defining, and communicating design. 3. Set out new creative potential by acquiring skills in next-generation tools and techniques.

	Course Contents	**CLOs**
1	Theoretical and technical understanding of computational design and practice through the introduction to basic scripting and parametric tools.	1, 4
2	Digital simulation, computational geometry, and shape grammars – as well as embodied and tangible forms of design interaction, fabrication, and expression.	2, 3
3	Advanced digital tools and methods for Building Information Modelling (BIM).	2, 3
4	Building Information Modeling (BIM) for creating and managing information on a construction project across the project lifecycle	3, 4

	Upon completion of this course the students will be able to:		**Mapping with PLOs**
Course Learning Outcomes (CLOs)	CLO1	Synthesize interdisciplinary knowledge of cultural and natural systems with technological systems.	1, 6
	CLO2	Apply interdisciplinary knowledge using computational design thinking and methods to solve architectural problems.	2, 6, 7
	CLO3	Use computational knowledge and skills for professional design tasks and/or advanced learning.	8, 6
	CLO4	Practice the ethical application of digital and computational technologies in/for architectural	9

		design.	

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Lectures and hands-on workshops	Task Assignment, Presentation and Viva voce
CLO2	Lectures and hands-on workshops	Task Assignment, Presentation and Viva voce
CLO 3	Skill-based tutorials and problem-based learning	Task Assignment, Presentation and Viva voce
CLO 4	Lecture and workshop	Task Assignment, Presentation and Viva voce

Learning Materials	
Recommended Readings	1. Menges, A., and Ahlquist, S. (2011). *Computational design thinking: computation design thinking*. John Wiley and Sons. 2. Yuan, P. F., Leach, N., and Menges, A. (2018). *Digital fabrication*. Tongji University Press Co., Ltd. 3. Garber, R. (2014). *BIM design: realising the creative potential of building information modelling*. John Wiley and Sons.
Supplementary Readings	1. Tedeschi, A. (2014). *AAD, Algorithms-aided design: parametric strategies using Grasshopper*. Le penseur publisher 2. Epstein, E. (2012). *Implementing successful building information modeling*. Artech House.

Course Code: 0319 01 Soc 6153	**Year:** First	**Term:** First
Course Title: Research Methodology		
Course Status: Core		
Credit: 3.0		
Prerequisite: None		

Rationale	The course instills essential competence for designing and conducting research on/in Architecture to facilitate design-research in postgraduate studios. With the conviction that research-driven design projects become more meaningful and effective in undertaking socio-technical problems of contemporary societies, students learn how research informs design and scholarly writing, using both classical and emerging methodologies and tools.
Objectives	1. Enable the understanding of the role of research in/for design. 2. Inculcate ability to use scientific methodologies/methods to posit architectural works within broader conceptual/theoretical discourses. 3. Impart skills for conducting research independently, critically and systematically, and producing design projects and scholarly texts. 4. Improve the ability to present and communicate architectural research in visual and written forms. 5. Enhance ability to read, interpret and evaluate research critically.

Course Contents		**CLOs**
Section A		
1	The implication of research	1
2	Philosophy of science: ontology, epistemology and axiology	1, 3, 4, 7
3	Methodology	4, 5
4	Ethics	6
Section B		**CLOs**
1	Research in/for/on architecture	1, 3, 4
2	Architectural research methods and techniques	4, 5
3	Fieldwork in/for/on architecture	4, 5
4	Research communication/presentation in architecture	2, 5, 6

	Upon completion of this course, the students will be able to:		**Mapping with PLOs**
Course Learning Outcomes (CLOs)	CLO1	Apprise the role of research as an essential element of designerly thinking.	1, 5
	CLO2	Conduct independent research for academic inquiry, practice and scholarly writing.	2, 6, 8
	CLO3	Posit architectural works within and along wider conceptual and theoretical discourses.	1, 5
	CLO4	Select and use appropriate methodologies to support	2, 5, 6

		research.	
	CLO5	Understand, collect and analyze data using qualitative, quantitative and mixed methods.	
	CLO6	Present and communicate architectural research, using visual and written medium.	3, 4
	CLO7	Read critically, interpret and evaluate research.	6

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Lecture and Peer group work (interactive)	Group presentation and Qand A performance evaluation
CLO2	Lecture and Academic writing exercise	Assignment (on design-research proposal writing)
CLO3	Lecture and Peer discussion	Peer assessment and Final Examination
CLO4	Lecture and Peer discussion	Design-research proposal report (on a selected topic) and Poster design
CLO5	Lecture and Online research	
CLO6	Lecture and Peer presentation	
CLO7	Lecture and Class reading exercise (peer groups) on reading techniques	Reflective paragraph writing and Final examination

Learning Materials	
Recommended Readings	1. Groat L. and D. Wang (2002). *Architectural Research Methods*. Wiley 2. Zeisel J. (2006). Inquiry by Design, W. W. Norton 3. Kumar R. (2014). Research Methodology, Sage 4. Sanoff H. 2016. Visual Research Methods in Design. Routledge
Supplementary Readings	1. Ruedi K. and I. Bordon (2000). *The Dissertation: An Architecture Student's Handbook*. Architectural Press 2. Cuff, D. (1992). *Architecture: The Story of a Practice*. MIT Press. 3. Hanington, B., and Martin, B. (2019). *Universal methods of design expanded and revised: 125 Ways to research complex problems, develop innovative ideas, and design effective solutions*. Rockport publishers. 4. Denzin N. K. and Y. S. Lincoln, (2017). *The SAGE Handbook of Qualitative Research*, Sage

Course Code: 0731 01 Arch 6131	**Year:** First	**Term:** First
Course Title: Building Performance Evaluation		
Course Status: Optional		
Credit: 3.0		
Prerequisite(s): None		

Rationale	The urban population will become half of the world's population within next few decades. A sustainable built environment will have no alternative in the upcoming days. So efficient and intelligent utilization of available resources is highly needed now. A cultural change is required at all levels of the building industry; from procurement to design, construction, use and maintenance of the building throughout its life cycle. This course aims to provide students with all this basic knowledge of the design construction and operation of low-energy and green buildings. Study of this course will help graduates to develop analytic and inquisitive perspectives to meet 21st century challenges.
Course Objectives	1. Enhance skills on state-of-the-art issues like internally and externally loaded building energy, building user and utility relationships, building maintenance, indoor air quality, and thermal comfort in buildings. 2. Equip with the skills to assess whether a particular built environment is fulfilling its designed targets and aspirations or not. 3. Learn, analyse and improve the level of building performance that leads to user satisfaction and increase the building occupancy rate. 4. Check with the international trends in building performance evaluation techniques, building energy simulation, building energy audit, retro-commissioning, and net-zero energy buildings.

	Course Contents	**CLOs**
	Section A	
1	**Energy use criteria in built environment**: energy use pattern and distribution in buildings. Internal and external load of building energy in different socio-cultural and physical context.	1, 2, 3
2	**Green building design and passive features**: green roof, wall, shading devices, building thermal insulation, smart glass, solar films, daylight utilization, natural ventilation, hybrid systems, green living quality, phase change materials applications.	1, 2
3	**Contemporary problems**: density planning, urban heat island effects, energy use efficiency, and thermal imbalance factors.	2, 3
4	**Advanced technological developments**: advanced glazing systems, building integrated photovoltaic (BIPV) products and systems, LED lighting, zero-energy building features, building energy management systems (BEMS), and retro commissioning.	1, 2
5	**Environment assessment criteria**: BEAM-Plus, LEED rating system, NZEB Calculation and Cost Optimality.	1, 2, 3, 4

	Section B	**CLOs**
1	**Building typology**: classification of buildings based on utility and user relationship in a different socio-cultural context.	2, 3
2	**Post-occupancy Evaluation (PoE) and Building Performance Evaluation (BPE):** PoE and BPE in new, existing and refurbished buildings to achieve continuous improvement and maintenance.	1, 2, 4
3	**Building performance evaluation methods:** study of BPE methods and their applicability in different socio-cultural and economic contexts.	1, 2, 3
4	**Building Codes and By-laws**: interpretation and analysis of building codes and building construction rules in order to upgrade the level of quality, effectiveness and efficiency of a building.	1, 2, 4

	Upon completion of this course the students will be able to:		**Mapping with PLOs**
Course Learning Outcomes (CLOs)	CLO1	Identify the importance and criticality of building performance assessment for a low-carbon society and for sustainable development.	1, 2, 5, 10
	CLO2	Assess the contribution of new materials, technologies, and procedures to realize higher efficiency of building use.	2, 3, 6
	CLO3	Relate socio-cultural and economical factors with the building performance issues.	2, 5, 6
	CLO4	Develop personal skills to: a) Analyze complex options and b) Use information to develop a research proposal. c) Frame effective personal research including reasoned argument. d) Be concise and persuasive in viewpoints. e) Negotiate and work within peer group to express/present views	1, 3, 6, 8, 10

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	**Teaching-Learning Strategy**	**Assessment Strategy**
CLO1	Lecture and Case studies	Term paper and Final exam
CLO2	Problem-based Learning and Presentation	Assignment and Final Exam
CLO3	Lecture and Group Discussion	Viva voce and Final Exam
CLO4	Workshop and presentation	Assignment and Final Exam

Learning Materials	
Recommended Readings	1. Mumovic, D., and Santamouris, M. (Eds.). (2013). *A Handbook of Sustainable Building Design and Engineering:" An Integrated Approach to Energy, Health and Operational Performance"*. Routledge. 2. Hardy, A. E., Schramm, U., and Preiser, W. F. (Eds.). (2018). *Building Performance Evaluation: From Delivery Process to Life Cycle Phases*. Springer.

	3. Wolfgang F.E. Preiser, Andrea E. Hardy, Ulrich Schramm, (2017), *Building Performance Evaluation: From Delivery Process to Life Cycle Phases*, Springer,
Supplementary Readings	1. Akram, M. W., MohdZublie, M. F., Hasanuzzaman, M., and Rahim, N. A. (2022). Global Prospects, Advance Technologies and Policies of Energy-Saving and Sustainable Building Systems: A Review. *Sustainability*, *14*(3), 1316. 2. Meir, I. A., Garb, Y., Jiao, D., and Cicelsky, A. (2009). Post-occupancy evaluation: An inevitable step toward sustainability. *Advances in building energy research*, *3*(1), 189-219.

Course Code: 0731 01 Arch 6137	**Year:** First	**Term:** First
Course Title: Housing: Policies and Finance		
Course Status: Optional		
Credit: 3.0		
Prerequisite(s): None		

Rationale	This course offers a critical review of history, theories and concepts that inform current practices, approaches and crises in the field of housing. It critically examines housing policies and the role of the state and market in different political economies and analyzes structures and processes in different national housing systems, housing production processes and the role of key actors. The course reviews international shifts in housing policy since the 1960s, in light of housing policies of Bangladesh and other developing countries. The course examines housing finance concepts and factors under different socio-economic spectrums to assess housing informality in developing countries. Through an extensive set of readings and critical analysis, this course intends to open up students' fresh minds for criticism, debate, possibilities and to enable them to postulate individual strategies for future praxis.
Objectives	1. Discuss, contrast and compare key ideas, precedents and theoretical discourse in global housing policy and finance. 2. Explore the housing informality in Global South and its socio-economic, socio-spatial and political construct. 3. Examine the role of different stakeholders in housing provision under othe political economies. 4. Critically examine current practices and approaches in housing provision and their impacts on society, culture, and the environment.

Course Contents		**CLOs**
Section A		
1	Concepts: Socio-economic, socio-spatial and socio-political perspectives of housing	1, 2
2	Housing and economic development: historical consequences	1, 2
3	Housing provision system: Role of state and market	1, 2
4	Housing policy: Political economy of housing in Global South and Global North.	1, 2, 3
5	Policy to Practices: Process *vs* Product	2, 3
6	Sustainable housing provision- the indicators	1, 2, 3
Section B		**CLOs**
1	Housing finance mechanisms: Practices in Global South	1, 2, 3
2	Housing affordability: Measurement and indicators	2, 3
3	Housing subsidies: Supply side *vs*Demand side	2, 3
4	Housing informality: A way of life	1, 2, 3
5	Pro-poor housing indicators- Global South	2, 3

6	Housing intervention in Bangladesh: A critical review	1, 2, 3

	Upon completion of this course the students will be able to:		**Mapping with PLOs**
Course Learning Outcomes (CLOs)	CLO1	Identify and critically analyze the key theories and practices in housing history, and contemporary discourse.	1, 2, 3, 4
	CLO2	Identify and critically analyze the key issues of housing problems in the Global South.	6, 9, 10
	CLO3	Interpret and evaluate the different housing policies and financial mechanisms of Global South and the Global North.	5, 6
	CLO4	Develop capacity for critical thinking and theability to formulate pro-poor housing strategies for the lower-end populace.	8, 9, 10

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Lecture and Team Teaching	Assignment and Group presentation
CLO2	Problem-based Learning and Presentation	Field survey and Group presentation
CLO3	Field survey and Group Discussion	Assignment and Term paper
CLO4	Field survey and Essay Writing	Term paper

Learning Materials	
Recommended Readings	1. NHA. (2016). *National Housing Policy*. National Housing Authority 2. UN Habitat 2016. *Habitat III Policy Papers*. Available online: https://habitat3.org/wp-content/uploads/PU3-HABITAT-III-POLICY-PAPER.pdf 3. UN Habitat 2016. *New Urban Agenda*. Available online: https://habitat3.org/wp-content/uploads/NUA-English.pdf; https://habitat3.org/wp-content/uploads/NUA-Bangla.pdf 4. Caprotti, F., Cowley, R., Datta, A., Broto, V. C., Gao, E., Georgeson, L., ... and Joss, S. (2017). The New Urban Agenda: key opportunities and challenges for policy and practice. Urban research and practice, 10(3), 367-378 5. Hamdi, N. (1995). *Housing without houses: participation, flexibility, enablement*. Intermediate Technology Publications Ltd (ITP). 6. Turner, J. F. C. (1972). Housing as a Verb. In J. F. C. Turner and R. Fichter (Eds.), *Freedom to Build: Dweller Control of the Housing Process* (pp. 148-175). The Macmillan Company. 7. Davies, M. (2006). *Planet of slums*. Verso, London. 8. Angel, S. (2000). *Housing policy matters: A global analysis*. Oxford University Press.
Supplementary Readings	1. AlSayyad, N. (2004). Urban informality as a ‘‘new’’ way of life. In A. Roy and N. Alsayyad (Eds.), *Urban informality: Transnational perspectives from the Middle East, Latin America and South Asia* (pp. 7–30). Lexington Books. 2. Cernea, M. M. (2000). The Risks and Reconstruction Model for Resettling Displaced Populations. In S. Guggenheim and M. Koch-Weser (Eds.), *Social Development in the World Bank: Essays in Honor of Michael M. Cernea* (pp. 235-264). Springer. 3. Choguill, C. L. (1988). Problems in providing low-income urban housing in Bangladesh. *Habitat International*, 12(3), 29-39. 4. Doling, J. (1999). Housing policies and the little tigers: how do they compare with other industrialised countries?. *Housing studies*, *14*(2), 229-250.

5. Harris, R., and Arku, G. (2006). Housing and economic development: The evolution of an idea since 1945. *Habitat International*, *30*(4), 1007-1017.
6. Keivani, R., and Werna, E. (2001). Refocusing the housing debate in developing countries from a pluralist perspective. *Habitat International*, *25*(2), 191-208.
7. Minnery, J., Argo, T., Winarso, H., Hau, D., Veneracion, C. C., Forbes, D., and Childs, I. (2013). Slum upgrading and urban governance: Case studies in three South East Asian cities. *Habitat International*, 39, 162-169.
8. Mostafa, A. (2017). *Evolution of Participatory and Support Based Approach for Strengthening Tenure Security, Housing and Community Resilience*: UPPR, UNDP.
9. Parvin, A., Hakim, S. S., and Islam, M. A. (2022). Policy, design, and way of life in resettlement projects: The case of Ashrayan, Bangladesh. *International Journal of Disaster Risk Reduction*, 103073.
10. Ward, P. M., and Smith, C. (2015). Housing rehab for consolidated informal settlements: A new policy agenda for 2016 UN-Habitat III. *Habitat International*, 50(2015), 373-384.

Course Code: 0288 01 Arch 6141	**Year:** First	**Term:** First
Course Title: Conservation: Principle, Practice and Management		
Course Status: Optional		
Credit: 3.0		
Prerequisite(s): None		

Rationale	The multidisciplinary nature of this course familiarizes with the realities of contemporary practices of heritage conservation. It covers the entire range of architectural conservation approaches – from international to local, aiming to develop knowledge and skills to assess, value and professionally engage with heritage buildings.
Course Objectives	1. Provide a clear understanding of the context, concepts, and theories of heritage conservation. 2. Familiarize with contemporary building and artefacts conservation process and post-conservation coordination. 3. Introduce heritage assessment and diagnosis. 4. Provide necessary knowledge and confidence to provoke sensitivity to social responsibilities, sustainability and contextual interventions to perform as heritage professionals.

Course Contents		**CLOs**
Section A		
1	Contemporary practice of heritage; needs, debates, philosophies, principles, and ethics of conservation.	1
2	The role, contribution, and debate of national and international agencies; law, charters, policy papers, and operational guidelines.	1
3	Recording, documentation, intervention, conservation planning and process, including post-conservation coordination of contemporary buildings and artefacts.	2, 3
4	Management and heritage sites; its mission, interpretative program, visitor infrastructure, funding strategies, volunteers, public relations, budgeting, and other essential operational concerns.	1, 2
Section B		**CLOs**
1.	Heritage assessment, diagnosis techniques, and methods covering condition mapping, damage mapping, pathologies of the historic materials etc.	2, 3
2.	SDG goal of UNESCO; its aims, conventions and working papers.	1, 2, 3
3.	Assessment procedure of World Heritage (WH) tentative list; case study and examples.	3, 4
4.	Heritage Impact Assessment (HIA) and its working methodology, process and reporting.	3, 4

	Upon completion of this course the students will be able to:		**Mapping with PLOs**
Course Learning Outcomes (CLOs)	CLO1	Understand current heritage conservation practices across global, national, and local scales.	1
	CLO2	Analyze and critically assess heritage conservation, documentation, and heritage management problems.	4, 6, 8
	CLO 3	Evaluate various heritage assessment and diagnosis techniques and methods.	2, 6, 8
	CLO 4	Build professional and technical capacity.	8, 10

Mapping CLOs with the Teaching-Learning and Assessment Strategy		
CLOs	**Teaching-Learning Strategy**	**Assessment Strategy**
CLO1	Lecture	Quiz and Class Test
CLO2	Problem-based learning and presentation	Assignment and Final Examination
CLO3	Lecture and group discussion	Assignment and Final Examination
CLO4	Lecture and presentation	Class Test and Final Examination

Learning Materials	
Recommended Readings	1. Feilden, B. (2007). *Conservation of historic buildings*. Routledge. 2. Feilden, B. B. M. (1989). *Guidelines for conservation: a technical Manual*. 3. Mathews M. (1998). Conservation Engineering. University at Karlsruhe. 4. Irwin, J. K. (2003). Historic preservation handbook. McGraw-Hill Professional Publishing. 5. Appleyard, D. (1979). The conservation of European cities.
Supplementary Readings	1. Fitch, J. M. (1990). Historic preservation: Curatorial management of the built world. University of Virginia Press. 2. Stipe, R. E. (Ed.). (2003). A richer heritage: Historic preservation in the twenty-first century. Univ of North Carolina Press. 3. Menon A. (Ed). Conservation of Immovable Sites. INTACH Publication, N. Delhi. 4. Stubbs, J. H., and Makaš, E. G. (2011). Architectural conservation in Europe and the Americas. John Wiley and Sons.

Course Code: 0732 01 CE 6171	**Year:** First	**Term:** First
Course Title: Advanced Structural System		
Course Status: Optional		
Credit: 3.0		
Prerequisite(s): None		

Rationale	In their B. Arch study, students learn about basic structural systems while they apply them to their design studio projects. But technological innovations have become radical, while advanced structural materials and systems are ever evolving. Construction of complex structures is now becoming possible, which was unthinkable previously. This course introduces these new construction materials, technologies and structural systems that will enable students to conceptualize, design and collaborate with regard to their projects.
Course Objectives	1. Introduce various advanced construction materials and their usage. 2. Provide knowledge of advanced construction methods. 3. Provide knowledge of advanced structural systems and their practical applicability.

Course Contents		**CLOs**
Section A		
1	**Materials used in long span/advanced structures:** High strength concrete, steel, laminated timber, Fibre Reinforced Polymer (FRP), other composite materials.	1
2	**Emerging Construction Methods**: New generation construction techniques for tall buildings, long span structures, shell, dome, bio-mimicry in Architecture projects etc.	1, 2
Section B		**CLOs**
1.	**Complex Structural Systems 1**: Analysis of structural force system and analysis procedure of frame structures, plate structures, folded structures, shell structures, and truss structures etc.	1, 3
2.	**Complex Structural Systems 2**: Analysis of structural force system and analysis procedure of cable structures, tent structures, pneumatic structures, and arch structures.	1, 2, 3

Course Learning Outcomes (CLOs)	Upon completion of this course the students will be able to:		**Mapping with PLOs**
	CLO1	Conceptualize various advanced materials and construction techniques.	1, 2
	CLO2	Gain knowledge of state-of-the-art structural	1, 2, 6

		systems and their applications.	

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Lecture and group discussion	Quiz and Class Test and Final Examination
CLO2	Learning and presentation	Assignment and Final Examination
CLO3	Problem-based learning and discussion	Assignment and presentation

	CLO3	Obtain skills to analyze the Complex Structural System.	1, 2, 6, 8, 9

Learning Materials	
Recommended Readings	1. Soboyejo, W. O., and Srivatsan, T. S. (2006). *Advanced structural materials: properties, design optimization, and applications*. CRC press. 2. Huff, T. (2021). *A Practical Course in Advanced Structural Design*. CRC Press. 3. Karnovsky, I. A., and Lebed, O. (2021). *Advanced methods of structural analysis*. Springer Nature. 4. Gayed, R., and Ghali, A. (2021). *Structural Analysis Fundamentals*. CRC Press. 5. Jain, A.K. (1999), "Reinforced Concrete Limit State Design", Nemchandand Bros, Roorkee 6. Anson, M., Ko, J. M., and Lam, E. S. S. (2002). *Advances in Building Technology:(ABT 2002)*. Elsevier.
Supplementary Readings	1. Babalola, A., Musa, S., Akinlolu, M. T., and Haupt, T. C. (2021). A bibliometric review of advances in building information modeling (BIM) research. *Journal of Engineering, Design and Technology*. 2. Chang, S. Y., Al Bahar, S. K., and Zhao, J. (Eds.). (2012). *Advances in Civil Engineering and Building Materials*. CRC Press.

Course Code: 0188 01 Edu 6171	**Year:** First	**Term:** First
Course Title: Architecture Education: Concepts and Practices		
Course Status: Optional		
Credit: 3.0		
Prerequisite(s): None		

Rationale	The aim of the course to produce post-graduates able to transpose the erudition with a thorough understanding of the ways in which architectural education has evolved in response to changing cultural and disciplinary conditions both nationally and internationally. In addition, the course will provide the knowledge for qualitatively outstanding and well-grounded architectural education and research; and consequently a well-informed professional practice.
Course Objectives	1. Understand Pedagogy and establish its relation with Architecture 2. Impart professional educator training in strengthening their expertise in design teaching, education and practice. 3. Develop skill in the use of fundamental teaching procedures, techniques and methods of teaching.

Course Contents		**CLOs**
Section A		
1	Evolution, Nature and Scope of Architecture Education	1, 2
2	Architecture Pedagogy in National and International Context	1, 2
3	Review of Architecture Education in Bangladesh	1, 3
4	Pedagogy of Architecture and Approaches of Teaching	1, 3
5	Elements and Principles of Architecture Education	1, 2, 3
6	Critical evaluations of model of architectural education	1, 2, 3
Section B		**CLOs**
1	Academic program design and Principles of Architecture Curriculum	1, 3
2	Lesson Planning and Tools and Techniques of Evaluation	1, 3
3	Educational Psychology, Thought Processes and Classroom Management	1, 3
4	Practical Training and Preparation for mock classes	1, 3

Course Learning Outcomes (CLOs)	Upon completion of this course the students will be able to:		**Mapping with PLOs**
	CLO1	Introduce the students with the theory, concepts, and research in the field of institutional learning	1, 5, 10
	CLO2	Learn the techniques and skill of conducting teaching in the formal classroom, and to equip with various classroom management techniques.	2, 6, 8, 9, 10
	CLO3	Develop skill in the use of fundamental teaching procedures, techniques and methods of teaching for architectural education and practices.	1, 2, 4, 7, 8, 10

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Lecture and presentation	Assignment and Final Exam
CLO2	Lecture and presentation	Quiz and Final Exam
CLO3	Problem-based Learning and Lecture	mock classes and Viva-voce

Learning Materials	
Recommended Readings	1. Bruce Joyce(2014), "Models Of Teaching"Pearson; 9 edition (April 14, 2014) 2. Dutton, T.A. (Ed.). 1991, Voices in ArchitecturalEducation: Cultural Politics and Pedagogy, Bergin and Garvey,New York, NY, USA. 3. Gelernter (1988) "Reconciling Lectures and Studios." Journal of Architectural Education 41(2): 46-52. 4. Perry, E. (1995) "Design Thinking: the studio as a laboratory of architectural design research." Architectural Research Quarterly 1(4): 16 - 21. 5. Ahmed A. S. M., and Naqi, A. (2006). State of Architectural Education in Bangladesh, Roundtable discussion on The Education of Architecture in Bangladesh (pp. 1-5). Institutes ofArchitects Bangladesh (IAB).
Supplementary Readings	1. George Kneller(1971),"Philosophy of Education" John Wiley and Sons Inc 2. Ashraf Salama, (1995)"New Trends in Architecture Education", Raleigh, N.C. 3. Salama, A. M. (1998). A new paradigm in architectural pedagogy: integrating environment-behavior studies into architectural education teaching practices. In Shifting balances: Changing roles in policy, research, and design (pp. 128-139). 4. Dutton, T. A. (1987). Design and studio pedagogy. Journal of architectural education, 41(1), 16-25. 5. Cohen, L. M., L. (1994). Research Methods in Education. London: Routledge. 6. Hejduk, J. (1988) Education of an Architect. New York City: Irwin S. Chanin School of Architecture of the Cooper Union, Rizzoli. 7. Kock, A. (2002). The Redesign of Studio Culture. A Report of the AIAS Studio Culture Force. Washington D.C: American Institute of Architecture Students

First Year Second Term

Course Code: 0731 01 Arch 6200	**Year:** First	**Term:** Second
Course Title: Dissertation Part-I		
Course Status: Core		
Credit: 4.0		
Prerequisite(s): None		

Rationale	As the terminal course for the degree, the dissertation offers the student to demonstrate competence, expertise, originality and relevance. Being an essential part of the thesis as this course provides the opportunity to undertake an in-depth study of a critical issue or theme within architecture. In this preparatory phase of the dissertation, the student critically investigates complex question(s) that concerns the discipline of architecture. Topics include but are not limited to architectural design, history and/or theory of architecture, architectural/building science, urban design, indigenous/vernacular/rural architecture and architectural technology. Toward improving his/her understanding of the topic/theme of study, the student looks for available materials and the relationship of their research to prior/prevailing works, targeting a specific outcome with implication for larger discourse(s). In this phase, under the guidance of a supervisor and based primarily on secondary sources (with possible pilot fieldwork), the student frames the aim, question(s), objectives and methods and produces propositions regarding the topic/problem, position, relevant scholarly research, and methodology. With this preparation, the student develops the final draft proposal overseen by an assigned supervisor(s) based on comments from a panel of examiners.
Objectives	1. Provide skills and attitudes to develop a research problem into a comprehensive research proposal diligently 2. Instill the capacity to design and conduct a research independently 3. Learn to formulate a robust methodology for research and fieldwork within a fixed timeframe 4. Acquaint yourself with essential research/inquiry skills and tools. 5. Instill attitude and competence to work closely with/under a supervisor, and a panel of experts.

	Course Contents	CLOs
1	**Writing:** Drafting the thesis proposal containing background information, problem statement, research question(s), design objective(s), and scopes and limitations of the specific thesis to contribute the knowledge in the research area.	1, 3
2	**Literature review:** Produce the draft proposal containing related literature based on the specific thesis, by holding a deeper understanding of the context, national and international ambit.	2, 3

3	**Research design and approach:** Develop research design and research approach to the thesis based on appropriate epistemology and methodology.	1, 4
4	**Working under supervision:** Finalize and submit the thesis proposal with regular feedback from the Supervisor based on literature review, conceptual understanding, and analysis of relevant data.	3, 4, 5

	Upon completion of this course the students will be able to:		**Mapping with PLOs**
Course Learning Outcomes (CLOs)	CLO1	Acquire skills and attitudes to independently develop, design and conduct a research adhering to a fixed timeline	2, 3, 8
	CLO2	Critically contextualize the research topic within established debates, academic literature(s) and/or practices	1, 6
	CLO3	Formulate a research proposal with a sound research design and methodology	2, 9
	CLO4	Improve fundamental research skills and use multiple data collection tools	3, 6, 8
	CLO5	Continue to improve research under the close supervision of supervisor(s), and a panel of experts	10

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Scheduled meeting/presentation with supervisor(s) and regular discussion and feedback	Proposal quality, punctuality and timeliness
CLO2	Scheduled meeting/presentation with supervisor(s) and regular discussion and feedback	Progress monitoring, assessment of the quality and depth of reviewed literature
CLO3	Scheduled meeting/presentation with supervisor(s) and regular discussion and feedback	Progress monitoring, assessment of the methodological quality (including scopes) of draft proposal
CLO4	Scheduled meeting/presentation with supervisor(s) and regular discussion and feedback	Assessment of the quality and appropriateness of research methods and tools selected and presentation quality of pilot fieldwork outcome
CLO5	Scheduled meeting/presentation with supervisor(s) and regular discussion and feedback	Motivation

Learning Materials	
Recommended Readings	1. Katerina, R. (2006). The Dissertation: An Architecture Student's Handbook. Taylor and Francis. 2. Creswell, J. W., and Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches. Sage publications. 3. Krathwohl, D. R., and Smith, N. L. (2005). How to prepare a dissertation prosposal: Suggestions for students in education and the social and behavioral sciences. Syracuse University Press. 4. Booth, W. C., Booth, W. C., Colomb, G. G., Colomb, G. G., Williams, J. M., and Williams, J. M. (2003). *The craft of research*. University of Chicago press. 5. Machi, L. A., and McEvoy, B. T. (2021). The literature review: Six steps to success. 6. Woodwell, D. (2013). Research Foundations: How Do We Know what We Know?. Sage Publications. 7. Yin, R. K. (2009). Case study research: Design and methods (Vol. 5). sage. 8. Bolker, J. (1998). Writing your dissertation in fifteen minutes a day: A guide to starting, revising, and finishing your doctoral thesis. Holt Paperbacks.
Supplementary Readings	1. Stake, R. E. (1995). The art of case study research. sage. 2. Silvia, P. J. (2007). How to write a lot: A practical guide to productive academic writing. American Psychological Association.

Course Code: 0731 01 Arch 6202	**Year:** First	**Term:** Second
Course Title: Advanced Design Studio		
Course Status: Core		
Credit: 6.0		
Prerequisite(s): Design Communication		

Rationale	This course introduces design as a process of critical inquiry and experimentation, covering the entire spectrum of architectural design. It promotes ways of seeing, understanding and interpreting objects, places and events, learning to look beyond the obvious and often absurd qualities of things. By assuming a Design Research approach, the course facilitates knowledge acquisition and the development of advanced skills in conceptualization, resolution and representation of well-reasoned ideas through drawings and modelling.
Objectives	1. Encourage questioning, lateral thinking, innovation/creativity, and engagement with design in a self-critical manner. 2. Foster issues as diverse as human survival and work out alternative and often unconventional ways of thinking and building while redefining what architecture can be and do. 3. Deal with the technicalities of climate, structure, services and construction in an integrated manner.

	Course Contents/Tasks	**CLOs**
This Advanced Design Studio provides exposure to four particular streams of specialization, enabling the student to choose and maintain for her/himself a focus. The student begins by choosing one specialization from the following four streams. Under this particular stream, the Design Project will be co-designed/developed and supervised, in a one-to-one manner, by a distinguished tutor.		
1	**Building services and technology:** Within the building industry, the building services and technology system, especially due to its ever-evolving nature, is of vital importance. In this module, the student will learn/identify a complex/new/innovative component (e.g. technology, device) of the system, assess its relevance critically, and produce an integrated design solution at the scale of a building project. Students may consider an entire building system and/or construction technologies that would inspire creative design ideas (conceptual, spatial, formal, tectonic, etc.) and their construction. This specialization will also enable in-depth exploration and philosophical underpinning – empathetic to students' ideals and aspirations.	1, 2, 3, 4
2	**Digital craft lab:** A paradigm shift is noticeable in the field of Architecture today through the advancement of digitalization, robotics and their cumulative. It calls for new or adapted concepts, where physical space seamlessly intertwines with digital content and electronic connections' language ties in with physical connections to digitally think and produce new technologies, forms, materialities and aesthetics. The studio will maintain a design-	1, 2, 3, 4

	manufacturing workflow where digital data will be produced using advanced CAD (especially parametric and BIM) and then directly fed to manufacturing equipment to fabricate various part geometries through CAM (e.g. Additive/Subtractive manufacturing, 3D printing, Robotic manipulation).	
3	**History and Theory:** The need for conservation and rehabilitation of architectural history/heritage is nothing new, although the scope of working as a professional in this field and seeking potential specialization for this globalized yet culturally corroding world is still growing. Against this backdrop, this specialization will strive to instigate novel thinking, new questions, and new standards of professional practice (including ethics) and produce new toolkits (and theories) to look at the 'old'. Additionally, this specialization will encourage critical probing into the history of particular buildings, philosophies, styles and monographs of a specific architect/practice (especially contemporary and modern masters of Bangladesh) and design/develop building concepts, schemes and details accordingly.	1, 2, 3, 4
4	**Environment, Behavior, and Climate:** The global environmental (and energy) crises call for a deeper understanding of environmental design principles and their sympathetic and sensible application in architectural practice. Considering this, the stream will facilitate learning environmental design concepts, methods and processes of the various stages of a project to foster a healthy, safe, less energy-intensive and carbon-neutral environment. Advanced computational modelling and simulation techniques and toolkits of building sciences will be used for design and presentation.	1, 2, 3, 4

	Upon completion of this course the students will be able to:		**Mapping with PLOs**
Course Learning Outcomes (CLOs)	CLO1	Research, analyze, and synthesize knowledge about specific sites in producing architectural design responses, with particular attention to users, topography, landscape ecology, sensory information, and climate.	1, 2, 6
	CLO2	Work in a specialized studio under expert supervision and develop interpersonal and verbal communication skills, critical thinking abilities and design through group activities and formative studio exercises.	3, 4
	CLO3	Explore creative processes and idea generation, reconcile divergent factors, and integrate knowledge and skills to produce design solutions.	7, 10
	CLO4	Perform technical documentation and specifications in design realization and construction cost planning and control processes.	5

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy

CLO1	Lectures and hands-on workshops	Desk critiques, studio pin-ups, and mid-term and final reviews
CLO2	Skill-based tutorials and problem-based learning	Desk critiques, studio pin-ups, and mid-term and final reviews
CLO3	Skill-based tutorials and problem-based learning	Desk critiques, studio pin-ups, and mid-term and final reviews
CLO4	Lectures and hands-on workshops	Desk critiques, studio pin-ups, and mid-term and final reviews

Learning Materials	
Recommended Readings	1. Kuniavsky, M. (2003). Observing the user experience: a practitioner's guide to user research. Elsevier. 2. Lunenfeld, P. (2003). *Design research: Methods and perspectives*. MIT press.
Supplementary Readings	1. Miller, E. (2012). Universal methods of design: 100 ways to research complex problems, develop innovative ideas, and design effective solutions. 2. Tymkow, P., Tassou, S., Kolokotroni, M., and Jouhara, H. (2013). *Building services design for energy efficient buildings*. Routledge.

Course Code: 0532 01 Geog 6270	**Year:** First	**Term:** Second
Course Title: Spatial Data Analysis Lab		
Course Status: Optional		
Credit: 3.0		
Prerequisite(s): None		

Rationale	This course provides the knowledge and skills necessary to investigate spatial patterns resulting from social and physical processes operating on or near the Earth's surface. Key theoretical concepts of quantitative geography are examined, including measures of geographical distribution (including point and areal pattern analysis) and spatial autocorrelation, interpolation and network connectivity. Focus remains on understanding the theories and contexts of spatial analysis so that students can identify and apply the best tool for problem-solving and to correctly and appropriately interpret and present results.
Course Objectives	1. Develop fundamental knowledge and understanding of contemporary and upcoming spatial data analysis methods. 2. Familiarize with relevant software and programming language for spatial data analysis, management and decision making. 3. Critically judge the appropriateness of different geographic and statistical analysis tools, and appreciate how they affect architectural design on various social issues.

	Course Contents/Tasks	CLOs
1	Overview on spatal data analysis	1
2	Techniques of spatial data analysis and management	1, 2
3	Learning a basic programming language and software about spatial data analysis and management (e.g. PYTHON,ArcGIS, R-Analysis of Spatial Data, QGIS, ClusterPyand GeoGrouper, GRASS etc. The course teacher will choose the appropriate software package according to the students need)	1, 2
4	Data processing/analysis skills with programming language	1, 2
5	Tools for analyzing the geographic and geometric information	2, 3
6	Use tools and software to understand the complexity of the analysis techniques and the lack of interactivity of the tools (if there is any)	2, 3
7	Analyze data using tools to achieve specified data goals and predict conclusions	2, 3
8	Present decision-making process.	2, 3

Course Learning Outcomes (CLOs)	Upon successful completion of the course, the students will be able to:		**Mapping with PLOs**
	CLO1	Understand the spatial data and its analysis process.	1, 2
	CLO2	Acquire basic data processing skill with programming language to analyze large set of spatial data.	1, 2, 6
	CLO3	Analyze the geographic and geometric information with various software and develop multiple scenarios as a suggestive measure.	1, 2, 6, 7, 10

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Lecture, Desktop Review and Workshop	Presentation and viva
CLO2	Lecture, workshop and problem-based learning	Assignment and internal assessment
CLO3	Lecture, Group Discussion and Problem-based Learning	Assignment and Presentation

Learning Materials	
Recommended Readings	1. Wegmann, M., Schwalb-Willmann, J., and Dech, S. (2020). *An Introduction to Spatial Data Analysis: Remote Sensing and GIS with Open Source Software*. Pelagic Publishing Ltd. 2. Brunsdon, C., and Comber, L. (2014). *An introduction to R for spatial analysis and mapping*. Sage. 3. Yamagata, Y., and Seya, H. (Eds.). (2019). *Spatial analysis using big data: Methods and urban applications*. Academic Press.
Supplementary Readings	1. Gao, J. (2022). Fundamentals of Spatial Analysis and Modelling. CRC Press. 2. Van Oort, P. (2006). *Spatial data quality: from description to application*. Wageningen University and Research.

Course Code: 0731 01 Arch 6231	**Year:** First	**Term:** Second
Course Title: Regenerative Design		
Course Status: Optional		
Credit: 3.0		
Prerequisite(s): None		

Rationale	The course will explore the fundemental principles of regenerative design and its application. The term "Regenerative Design" describes the processes that restore, renew and revitalize the sources of energy and materials, thereby creating sustainable systems that integrate the needs of society with the integrity of nature. Since Sustainability itself is not good enough to repair environmental disasters, regenerative design and development demand that the architects take an active part in the healing process of the earth, and not simply minimize the impact of the actions.
Course Objectives	1. Equip students with fundamental knowledge of regenerative design principles, strategies and framework. 2. Introduce the concept of design and planning with nature, including Biophilic design, and ecological planning and design. 3. Discuss and criticize the process of regenerative-adaptive design and adaptation planning.

Course Contents		**CLOs**
Section A		
1	**Introduction:** Ecological and economic challenges, and built environment; modern history of sustainable architecture	1
2	**Definitions and paradigm shift:** Negative impact reduction via increased efficiency; positive impact via increased regenerative effectiveness	1
3	**Design principles of regenerative design:** Guiding principles; a framework for regenerative design; strategies for regenerative building design – selection of a construction system, defining of the design elements and their performance, enhancing air quality and human health, energy saving, renewable energy production, water management, design with nature, choice of regenerative materials	1, 2, 3, 4
Section B		**CLOs**
1	**Indicators and metrics of regenerative design:** Life cycle standards and system boundary; functional unit, year, tools and indicators; life cycle inventory.	1, 2
2	**Interconnections between people and their natural environments:** Innate affiliation with nature; Biophilic design and patterns;	1, 2
3	**Design and planning with nature:** History of planning and design that considers the environment; back to nature; design and planning with nature; ecological planning and design; the process of place; design for	1, 2, 3, 4

	human ecosystems	
4	**Regenerative-adaptive design:** Regenerative-adaptive design; regenerative design fundamentals – regeneration, place, patterns, the generative code and regenerative design; Adaptive design fundamentals; the regenerative-adaptive design model – adaptation planning, regenerative-adaptive system of processes	1, 2, 3, 4

	Upon completion of this course the students will be able to:		**Mapping with PLOs**
Course Learning Outcomes (CLOs)	CLO1	Understand the main issues, challenges and opportunities for designed environments in relation to regenerative design for medium and large-scale projects.	1, 8
	CLO2	Critically discuss regenerative designed environments in relation to leading-edge issues and technologies	1, 2, 5
	CLO3	Develop a philosophical position and stance with regard to sustainable and regenerative designed environments.	1, 2, 4, 5, 6
	CLO4	Employ appropriate representational media to convey essential research findings and design outcomes with regard to sustainable and regenerative designed environments.	3, 4, 6

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Lecture and Group Discussion	Class Test, Assignment and Final Exam
CLO2	Problem-based Learning and Presentation	Assignment and Final Exam
CLO3	Problem-based Learning and Group Discussion	Presentation, Assignment and Final Exam
CLO4	Problem-based Learning and Discussion	Presentation, Exhibition and Final Exam

Learning Materials	
Recommended Readings	1. Roös, P. B. (2021). Regenerative-Adaptive Design for Sustainable Development: A Pattern Language Approach. Springer. 2. Attia, S. (2018). *Regenerative and positive impact architecture: Learning from case studies*. Springer International Publishing, London, United Kingdom.

Course Code: 0731 01 Arch 6233	**Year:** First	**Term:** Second
Course Title: Water Sensitive Design		
Course Status: Optional		
Credit: 3.0		
Prerequisite(s): None		

Rationale	The course intends to give students expertise in the concepts and techniques of *water-sensitive urban design (WSUD)* and to allow them to apply these techniques to integrate the water management into the urban landscape.The course will address data requirements, tools, approaches, relevant planning policy frameworks, decision-making, and implementation experiences needed to build and foster water-sensitive cities.
Objectives	1. Familiarize with all forms of water as an opportunity at diverse scales. 2. Design built environment supplements, and support the function of the natural environment. 3. Influence decision-making process of stakeholders towards water-sensitive manners.

Course Contents		**CLOs**
Section A		
1.	**Historical background:** Discussion on the historical transition of cities from the viewpoint of water management.	1
2.	**UWCM:** Knowledge of the main components of Urban Water Cycle management and the interactions with other essential aspects.	2
3.	**Impacts of UWM:** Social, environmental and economic impacts of urban water management.	1, 4
4.	**Tools and Techniques:** Structural and non-structural tools and techniques for conceptual design, operation, and maintenance.	3
Section B		**CLOs**
5	**Principles and practices**: An introduction to WSUD (its principles, objectives, context within other urban planning and sustainability policy and practice) in developed and developing countries and implementation of urban design practices.	2, 3, 4
6	**Sustainable Sanitation**: Introduce City Wide Integrated Sanitation (CWIS) focusing on both Fecal Sludge Management (FSM) and Solid Waste Management (SWM).	2, 3
7	**Stakeholder Involvement:** Analyze the importance of stakeholder involvement in the urban water management process	5, 6
8.	**Mainstreaming:** Ways of mainstreaming water-sensitive elements to the	4, 6

	urban development process. Discussion on concrete examples(real-world and hypothetical) of such mainstreaming	

	Upon completion of this course the students will be able to:		**Mapping with PLOs**
Course Learning Outcomes (CLOs)	CLO1	Appraise the role of water as a resource in the urban context.	1, 9
	CLO2	Understand and analyze the various components of the urban water cycle, including their interactions.	1, 2
	CLO3	Assess and choose a range of structural and non-structural techniques for WSUD.	2, 6
	CLO4	Design a range of WSUD scenarios for a given urban layout.	3, 6
	CLO5	Explain and critique implementation and institutional issues relating to WSUD, including maintenance and policy.	8
	CLO6	Work collaboratively in a multi-disciplinary team.	4, 10

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Lecture and Peer discussion	Peer Assessment and Final Examination
CLO2	Lecture and Group discussion	Group discussion and Q&A performance Evaluation
CLO3	Lecture and Group discussion	Final Examination
CLO4	Group work	Assignment and Final Examination
CLO5	Lecture and Peer discussion	Class test and Final Examination
CLO6	Lecture and Group work	Q&A performance Evaluation

Learning Materials	
Recommended Readings	1. Howe, C., and Mitchell, C. (2011). *Water sensitive cities*: IWA Publishing. 2. Grant, G. (2016). *The water sensitive City*. John Wiley and Sons. 3. Rogers, B. C., Dunn, G., Hammer, K., Novalia, W., de Haan, F. J., Brown, L., ...and Chesterfield, C. (2020). Water Sensitive Cities Index: A diagnostic tool to assess water sensitivity and guide management actions. *Water research*, *186*, 116411.
Supplementary Readings	1. McCallum, T., and Boulot, E. (2015). Becoming a Water Sensitive City: A Comparative Review of Regulation in Australia. 2. Barron, N. J., Kuller, M., Yasmin, T., Castonguay, A. C., Copa, V., Duncan-Horner, E., ... and Deletic, A. (2017). Towards water sensitive cities in Asia: An interdisciplinary journey. Water Science and Technology, 76(5), 1150-1157.

Course Code: 0731 01 Arch 6243	**Year:** First	**Term:** Second
Course Title: Advanced Construction Technology: Fabrication and Material		
Course Status: Optional		
Credit: 3.0		
Prerequisite(s): None		

Rationale	The course intends to explore issues and concepts relating to contemporary developments in materials, construction and building engineering technology. Students will engage with these new theories and technologies in an investigative environment to develop an understanding of various structural technology, building fabric, materiality, detailing and the connection between design, construction and structures. Students will learn to critique the suitability of using those technologies while designing contemporary structures.
Objectives	1. Familiarize with advanced construction Technology, material and behavior. 2. Provide a clear understanding of contemporary construction issues and façade fabrication. 3. Understand the sustainability and environmental issues of using advanced materials and technology. 4. Prepare students to demonstrate the outcome professionally through the critique of advanced construction practices through transferable learning skills.

	Course Contents	**CLOs**
	Section A	
1	**Advance Structure:** Advanced structural systems and their load distribution system, structural detail and expression.	2, 4
2	**Newer Construction Technology:** Contemporary construction technology which includes pre-fabrication, BIM and other software base design solutions.	2, 5
3	**Contemporary Material and Fabrication:** Advanced design process and construction technology using high-performance steel, Aluminum, Glass, tensile membrane and other fabrication material as a building material.	1, 2, 5
	Section B	**CLOs**
1	**The Benefit of Newer Technology:** The Benefit of new industrialized techniquesto the building industry and their positive impact on the design industry.	1, 4
2	**Effect of Advance Fabrication:** Analyze the socio-economic and climatic effect of using technological advancement in the construction industry.	3, 4
3	**Sustainability Issues:** Building and material technologies of low environmental impact.	3

Course Learning Outcomes (CLOs)	Upon completion of this course the students will be able to:		**Mapping with PLOs**
	CLO1	Carry out self-guided research in order to appraise the use of advanced materials as they impact the design process.	1, 6
	CLO2	Demonstrate skills in the detailing of contemporary complex building structures and envelopes.	1, 8
	CLO3	Explain and debate complex sustainability and environmental issues related to the use of materials.	2, 5, 6
	CLO4	Employ research methods into contemporary construction practices and critique engineering principles used in advanced materials behavior.	4, 9
	CLO5	Apply transferable skills to achieve professional and disciplinary outcomes.	8, 10

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Lecture and Team teaching	Quiz and Class Test
CLO2	Lecture and Presentation	Assignment and Final Exam
CLO3	Lecture and Group discussion	Quiz and Class Test
CLO4	Lecture and Presentation	Assignment / Class Test
CLO5	Lecture and Group discussion	Viva voce and Assignment

Learning Materials	
Recommended Readings	1. Chudley R.,GreenR.,Hurst M. and Toplis S.,(2012) *Advanced construction technology.* Pearson Education. 2. Herzog T.,Krippner R., and Lang W., (2017). *Façade Construction Manual.* Walter de Gruyter.
Supplementary Readings	1. Dunn, N. (2012). Digital fabrication in architecture. Laurence King Publishing. 2. Rivera, R. (2014). Membrane Structures: First Steps toward Form Finding. Membranas Estructurales.

Course Code: 0731 01 Arch 6245	**Year:** First	**Term:** Second
Course Title: Independent Study Module (ISM)		
Course Status: Optional		
Credit: 3.0		
Prerequisite(s): None		

Rationale	Independent (secondary) research plays a vital role in graduate studies. This ISM is designed to enable students to explore an Architectural topic in depth. In discussion with and approval from her/his supervisor, the student pursues this particular study topic of her/his interest, which is not otherwise offered by the program. Typically, this course may be used as part of the student's preparation for the upcoming thesis, especially to help her/him write the literature review section. A formal, written agreement is drawn up, giving a clear account of the topic, program of study, assignments, evaluation, and other pertinent details. The Head's and/or supervisor's approval for written agreement is required. Regular meetings and reports are expected. Evaluation is based on 100% continuous assessment and must be worked out between the concerned student and the supervisor before seeking approval.
Objectives	1. Support (to identify and design) a small-scale research project of the student's area of interest to improve her/his knowledge base. 2. Facilitate an in-depth appraisal of the identified topic based primarily on secondary sources. 3. Provide skills to critically review and evaluate historical and current theory/policy materials for a deeper understanding of the topic. 4. Improve capabilities for independent research and producing academic reports.

Course Contents		**CLOs**
The student approaches a supervisor and works out an agreed topic. The student receives regular feedback from the supervisor (who will have consulted with the Program Coordinator and formally assigned by the Discipline). The student keeps submitting weekly assignments/literature reviews and ends with a complete proposal/term paper (about 8,000 words) at the end of the term.		
1	Short proposal (about 1,000 words) with rationale, the general area of focus and scope of the field and aims for the particular Individual Study proposed.	1, 2
2	Methods by which material and information will be accessed and analysed.	2, 3
3	Annotated bibliography; and a final (week-wise) reading list with proper referencing in any academic style.	1, 2, 3
4	Final report/term paper/review paper.	1, 2, 3, 4

	Upon completion of this course the students will be able to:		Mapping with PLOs
Course Learning Outcomes (CLOs)	CLO1	Gain in-depth knowledge and understanding of the topic student has chosen.	1, 2, 3, 4
	CLO2	Critically reflect on current and/or important issues, theoretical or professional, and debates on the topic.	6, 9, 10
	CLO3	Evaluate relationships between theory, research and scholarship, policy and practice, bringing research evidence to bear in informing discussion.	5, 6
	CLO4	Produce academic writing in the form of an elaborate written report/term paper.	8, 9, 10

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Lecture and Problem-based Learning and Presentation	Assignment and Group presentation
CLO2	Literature review and Field survey	Field survey and presentation
CLO3	Literature review and Field survey	Field survey and presentation
CLO4	Essay writing	Term paper (min. 3000 words)

Learning Materials	
Recommended Readings	The students will develop the list of the references with the help of their supervisor.
Supplementary Readings	The students will develop the list of the references with the help of their supervisor.

Course Code: 0731 01 URP 6271		**Year:** First	**Term:** Second
Course Title: Rural Urban Settlement System			
Course Status: Optional			
Credit: 3.0			
Prerequisite(s): None			
Rationale	In today's context of rapid rural transformation, and the increasing blurring of socio-economic-cultural boundaries between traditional rural and urban spaces and materialities, this course provides relevant theoretical and firsthand knowledge about contemporary discourses on rural-urban interaction. It introduces students to appropriate analytical tools for critically appraising and designing rural-urban spaces and materialities. The course particularly emphasizes on materials and learning during the post-WWII decades, in which the Global South nations underwent (and still going through) unprecedented transformation. The course assumes an eco-influenced 'Settlement' perspective, but borrows scholarly materials from disciplines such as Anthropology, Architecture, Cultural Studies, Urban Geography and Urban Planning.		
Objectives	1. To acquaint with the concept of 'Settlements' as a more ecological		

	perspective of the built environment, going beyond the traditional 'rural' and 'urban' classification 2. To illustrate, theoretically, about various spatial and non-spatial forms of rural and urban coexistence 3. To learn about the conditions of rural-urban design, focusing particularly on contemporary perspectives 4. To demonstrate the ability of understanding and applying theoretical and analytical tools to study rural-urban spaces and materialities

Course Contents		CLOs
Section A		
1	'Settlement' perspective and rural-urban interaction	1
2	**Rural in the urban spatial form** A tale of two cities (Siena, Louang Prabang)	2
3	**Key debates in rural-urban linkage studies** Dichotomy/continuum/flow, Dispersal, Desakota, Agropolitan (Networked model)	2, 3
4	**Rural-urban spatial encounters** Ruralopolises, Desakota, Urban villages, urban agriculture, fringe belts, peri-urban, agropolises, ethnic encounters/migration	3, 4
Section B		**CLOs**
1	**Rural-urban struggles: role of modern/modernity** (Mexico, Chandigarh)	3, 4
2	**Planning/designing rural in urban** (Modular City, Linear City, Garden City, Broadacre City, Rurban, Regional Planning)	3
3	**Theories** (Dependency, Systems, Centre-periphery, Central Place theory)	3, 4
4	**Studying settlements** (Settlement system analysis, typo-morphology)	4

	Upon completion of this course the students will be able to:		**Mapping with PLOs**
Course Learning Outcomes (CLOs)	CLO1	Familiarize with the 'Settlements' perspective of the built environment, by questioning 'rural' and 'urban' as discrete categories	1
	CLO2	Appraise the myriad social, cultural, economic, spatial, and environmental ways rural and urban coexist, while touching upon its key debates	1, 5
	CLO3	Identify, analyze and explain the ideological, political, economic, aesthetic and socio-cultural conditions of rural-urban design, focusing primarily on contemporary perspectives	1, 4, 6
	CLO4	Apply theoretical and analytical tools to study rural-urban spaces and materialities	2

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Lecture	Final Examination and class Test
CLO2	Lecture and class Reading	Assignment (issue based) and

		Presentation
CLO3	Lecture and group Discussion	Final Exam and Class Test
CLO4	Lecture with tutorial and field trips/excursions	Poster presentation

Learning Materials	
Recommended Readings	1. Bourdier J.-P. and N. AlSayyad (eds.) (1989). Dwellings, Settlements, and Tradition: Cross-cultural Perspectives. University Press of America. 2. Peter Saunders (1981). Social Theory and the Urban Question (2nd Ed.), Routledge 3. Gebre T. and B. Gebremedhin (2019). The mutual benefits of promoting rural-urban interdependence through linked ecosystem services. *Global Ecology and Conservation*.Vol 20. https://doi.org/10.1016/j.gecco.2019.e00707 4. Moravánszky A. (2017). Peripheral Modernism: Charles Polónyi and the lessons of the village, The Journal of Architecture, 22:4, 662-688, DOI: 10.1080/13602365.2016.1204076 5. Qadeer, M. A. (2000). Ruralopolises : The Spatial Organisation and Residential Land Economy of High-density Rural Regions in South Asia. *Urban Studies*, 37(9), 1583-1603. https://doi.org/10.1080/00420980020080271 6. Sarin, M. (1982). Urban Planning in the Third World: The Chandigarh Experience (1st ed.). Routledge. https://doi.org/10.4324/9780429343254 7. Tacoli, C. (1998). Rural-urban interactions: a guide to the literature. *Environment and urbanization*, 10(1), 147-166. 8. Wirth L. (1938). Urbanism as a way of life.The American Journal of Sociology, Vol. 44, No. 1, pp. 1-24
Supplementary Readings	1. Bowen W. M. and R. E. Gleeson (2019). The Evolution of Human Settlements. Palgrave Macmillan.

Second Year First Term

Course Code: 0731 01 Arch 7100	**Year:** Second	**Term:** First
Course Title: Dissertation Part-II		
Course Status: Core		
Credit: 12.0		
Prerequisite(s): Dissertation Part-I		

Rationale	Architecture is as textual as it is visual and spatial. A dissertation in architecture is made of words, as this second phase of the thesis focuses on the actual writing of the dissertation. Moving forward, the student further analyses the collected literature and keeps improving the methodology from the first phase, resulting in the final structuring and writing up of the manuscript. Research, fieldwork and analytical methods may similarly be drawn from the full breadth of disciplinary, interdisciplinary or transdisciplinary sources/practices relevant to architecture. However, a large share of research methods is expected to be visual and spatial. With regular comments/inputs/critiques from a parallel colloquium course, findings/results are expected to be a set of coherent arguments with clear conclusions. The

	dissertation must be well written (proofread), rationally presented, ethically sound, and strictly adhered to the standard conventions of citing and referencing.
Course Objectives	1. Provide skills in writing/presenting research outcome(s) in the form of a concise essay that scientifically discusses/documents the development of the entire work. 2. Learn to appraise writing as a powerful medium for crystallizing architectural thoughts and critical arguments in the form of texts and narratives supported by visual and numerical figures and graphics. 3. Familiarize with a thesis report's standard structure and format, similar to professional-level reports and public documents. 4. Learn to use various data collection and analytical tools (visual, qualitative and quantitative) in addressing the research question(s).

Course Contents		**CLOs**
1	**Fieldwork and research**: Carry out necessary literature review and fieldwork to collect additional data (followed by supplementary data collection activities to compensate for missing data).	2, 3
2	**Continuous improvement**: Keep improving the thesis rationale, refining questions and objectives based on constructive feedback and comments from the thesis supervisor and the examiner/reviewer panel.	1, 2
3	**Writing-up:** Writing up the thesis report while maintaining the right orientation to the research objectives and questions.	1, 3

	Upon completion of this course the students will be able to:		**Mapping with PLOs**
Course Learning Outcomes (CLOs)	CLO1	Write academic reports, complying with scientific writing standards and norms	3
	CLO2	Learn about, and be able to use standard scientific structure/format of academic essays/reports	8
	CLO3	Collect and source research materials and data from fieldwork using appropriate tools and methods	2

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	**Teaching-Learning Strategy**	**Assessment Strategy**
CLO1	Individual work progress monitoring under close supervision and assessment of the adequacy of the methodology	Progress assessment, colloquium and defense
CLO2	Discussion and comments and feedback from supervisor	Progress assessment and draft (chapter) submission
CLO3	Fieldwork, assessment of the appropriateness of research methods/tools/techniques and analysis and synthesis of primary and secondary data	Colloquium

Learning Materials	
Recommended Readings	1. Katerina, R. (2006). The Dissertation: An Architecture Student's Handbook. Taylor & Francis. 2. Creswell, J. W. & Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches. Sage. 3. Krathwohl, D. R., & Smith, N. L. (2005). How to prepare a dissertation proposal: Suggestions for students in education & the social and behavioral sciences. Syracuse University Press. 4. Booth, W. C., Colomb, G. G., Williams, J. M., Bizup, J., & FitzGerald, W. T. (2003). The craft of research. Chicago guides to writing, editing. University of Chicago Press. 5. Machi, L. A., &McEvoy, B. T. (2021). The literature review: Six steps to success. Corwin. 6. Woodwell, D. (2013). Research Foundations: How Do We Know What We Know? Sage. 7. Yin, R. K. (2009). Case study research: Design and methods (Vol. 5). Sage. 8. Bolker, J. (1998). Writing your dissertation in fifteen minutes a day: A guide to starting, revising, and finishing your doctoral thesis. Holt Paperbacks.
Supplementary Readings	1. Stake, R. E. (1995). The art of case study research. Sage. 2. Silvia, P. J. (2007). How to write a lot: A practical guide to productive academic writing. American Psychological Association.

Course Code: 0731 01 Arch 7108	**Year:** Second	**Term:** First
Course Title: Thesis Colloquium		
Course Status: Core		
Credit: 4.0		
Prerequisite(s): Dissertation Part-I		

Rationale	With this course, the student engages in various sharing/discussion sessions to receive constructive comments and directions from their supervisor(s), examiners and graduate students on multiple aspects of the research process. With prior approval of the thesis supervisor, key activities involve presenting various phases/parts of their dissertation, including the research problem, research question(s) and objectives, literature mapping, methodology, findings from the fieldwork and writing. The critical feedback helps continuously improve the dissertation structure and process. As the most basic supplementary course to the dissertation, it thus helps sharpen the overall research design including the design problem, refining research question(s) and objectives, selecting the relevant literature, choosing an appropriate methodology and reporting findings.
Objectives	1. Skills to present/share various phases of the dissertation to supervisor(s), examiners and other experts. 2. Instill advanced skills in public presentation using a combination of architectural, audio-visual and oral means. 3. Improve attitudes of continuous development through regular peer feedback on sharpening the research problem, refining research question(s) and objectives, selecting relevant literature, and choosing the most appropriate methodology and report findings.

	Course Contents	CLOs
1	Formulation of the research question(s) where an individual student can apply her/his research competencies.	1
2	Justifications of the thesis rationale, based on constructive feedback and comments from the thesis supervisor and additional reviewer panel.	1, 2
3	Discussion, defence, explanation and communication through thesis presentation.	2, 3
4	Prepare the thesis for a public and academic sharing session and discuss the overall thesis.	3, 4

Course Learning Outcomes (CLOs)	Upon completion of this course the students will be able to:		**Mapping with PLOs**
	CLO1	Gain skills and attitudes to systematically develop a research problem/question(s) through expert and peer feedback.	2, 4, 8
	CLO2	Improve attitudes toward the constructive role of the peer process in academic research in terms of exposure to internal an`d external experts.	6, 9
	CLO3	Acquire skills in public defense	3, 10
	CLO4	Communicate works in a well-structured manner, using architectural and non-architectural techniques.	3, 4

Mapping CLOs with the Teaching-Learning and Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Presentation before Supervisor(s) and Examiners and collect feedback and present evidence of suggested amendments.	Presentation quality in Colloquium Presentation quality in Defense Confidence
CLO2	Engage enthusiastically in constructive Q & A sessions.	
CLO3	Engage in regular presentation sessions with experts and peers.	
CLO4	Make presentations using state of the art visual and non-visual techniques.	

Learning Materials	
Recommended Readings	1. Gurumani, N. (2019). Scientific thesis writing and paper presentation. MJP Publisher. 2. Benn, K., and Benn, C. (2006). Professional thesis presentation: A step-by-step guide to preparing your thesis in Microsoft Word. Pearson Education New Zealand. 3. Brinton, W. C. (1939). Graphic presentation. РиполКлассик. 4. Roberts, C. M. (2010). The dissertation journey: A practical and comprehensive guide to planning, writing, and defending your dissertation. Corwin Press. 5. Bolker, J. (1998). Writing your dissertation in fifteen minutes a day: A guide to starting, revising, and finishing your doctoral thesis. Holt Paperbacks. 6. Silvia, P. J. (2007). How to write a lot: A practical guide to productive academic writing. American Psychological Association. 7. Cone, J. D., and Foster, S. L. (1993). Dissertations and theses from start to finish: Psychology and related fields. American Psychological Association.
Supplementary Readings	1. Lucas, S., and Stob, P. (2004). The art of public speaking (p. 382). New York: McGraw-Hill. 2. Syracuse university libraries. (2022), Architecture: Thesis Preparation https://researchguides.library.syr.edu/c.php?g=978052and p=7075240

20.Grading and Evaluation

20.1.1 Grading Scale

Letter Grades and corresponding Grade Points will be awarded following provisions shown below:

Numerical Grade	Letter 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 (regular)	2.25
40 to less than 45%	D	2.00
Less than 40%	F	00
Incomplete	I	
Withdrawn	W	
Continuation (for project, thesis design, etc. course)	X	

20.1.2 Cumulative Grade Point Average (CGPA)

GPA will be calculated as per the standard practices at the undergraduate level of Khulna University. A student's performance will be evaluated in terms of three indices, viz. Term Grade Point Average (TGPA), Yearly Grade Point Average (YGPA), and Cumulative Grade Point Average (CGPA). The TGPA is computed by dividing the total points earned in a Term by the number of credits taken in the Term. The YGPA is computed by dividing the total grade points earned in two Terms in a year by dividing the number of credits taken in that year. The CGPA is computed by dividing the total grade points accumulated up to date by the total completed credits. Thus a student who has earned 275 grade points in attempting 100 credits of courses would have an overall CGPA of 2.75. The students will be awarded the Degree with Distinction, if their CGPA is 3.75 or above.

20.1.3 Evaluation of Theory Courses

All theory courses will be evaluated out of 100 marks. The marks will be distributed as follows:

Attendance:	10 Marks
Continuous Assessments:	30-40 Marks
Term Final:	50-60 Marks
Total:	**100 Marks**

20.1.4 Evaluation of Sessional Courses

All sessional courses will be evaluated out of 100 marks. The marks will be distributed as follows:

Attendance:	10 Marks
Sessional Assessments:	60 Marks
Viva voce:	30 Marks
Total:	**100 Marks**

(a) For both theory and sessional courses, attendance shall carry 10 marks and the basis for awarding marks will be as follows:

Attendance (%)	Marks
≥ 90	10
85 to < 90	9
80 to < 85	8
75 to < 80	7
70 to < 75	6
65 to < 70	5
60 to < 65	4
< 60	0

(b) The continuous assessments (30 to 40 marks) for theory courses may be conducted in the form of written class examinations, assignments, home-works, presentations, quizzes, viva voce, mid-term, etc. For any theoretical course, there shall be at least four assessments. Section best (A and B) assessments shall be counted. A mid-term Examination may be taken if a Discipline/POE opts for it. The concerned Discipline will allocate marks for mid-term and continuous other evaluations in such a case. The course teachers must submit the

continuous assessment and sessional assessment mark sheets to the Chair of the Examination Committee before the starting of the Term final examination.

(c) The remaining 50 to 60 marks will be allocated for the term final examination.

(d) A student who fails in any course(s) in the Term final examinations or who registered for the course(s) but did not sit for the examination, the concerned course(s) will be considered as retake course(s).

(e) A student retaking theory course(s) for clearing/passing or improvement must appear at the mid-term (if any) and Term final examinations. A student may attend continuous assessments also on the written approval of the Discipline Head; otherwise, the marks of continuous assessments will be maintained from the student's previous records. The marks of attendance will be carried forward from earlier Term. The obtained grade will be downgraded in case of retaking course(s).

(f) Examination procedure related other guidelines of the latest 'Ordinance for Undergraduate Examination' of Khulna University will generally be applicable for the Master's programs, if not conflicting with this Ordinance.

20.1.5 Evaluation of Viva Voce

A Discipline may include Viva Voce of 01/02 credit(s) at the end of each Term. The concerned Examination committee of that Term will conduct the viva and assess the students out of 100 marks.

20.1.6 Dissertation under Mixed-mode

i) There will be two components of the Dissertation, namely Dissertation Part-I in one Term for proposal development, and Dissertation Part-II in another term for completing the Dissertation. The total credit for the Dissertation will be between 15 to 20 credits. The credit allocation for proposal development and dissertation parts will be 3-5 credits and 12-15 credits, respectively.

ii) A Dissertation (both proposal and Dissertation) will be evaluated out of 100 marks.

Marks distribution of Dissertation Part-I will be as follows:

a)	Assessment of Supervisor	30 marks
b)	Proposal Presentation	70 marks

Marks distribution for Dissertation Part-II will be as follows:

a)	Assessment of Supervisor	20 marks
b)	Dissertation Evaluation	50 marks
c)	Defense (Oral examination)	30 marks

iii) Dissertation Part-I will usually commence in the Master's first-year second-term and Dissertation Part-II in the second-year first-term (final Term).

iv) The final evaluation of the Dissertation Part-II will be made at the end of the final Term. However, the evaluation of the Dissertation Part-I will be done in the corresponding Term.

v) A student registered for Dissertation will undertake research work under the guidance of a supervisor and a co-supervisor (if necessary).

vi) The research needs to be carried out in this University or at the appropriate place(s) approved by the Supervisor in consultation with the Discipline Head.

vii) There shall generally be one Supervisor for each student, but a co-supervisor may also be appointed if needed. A teacher not below the rank of Assistant Professor will act as supervisor/co-supervisor. However, a Lecturer with MPhil/ Master's by Research/ Ph.D. degree is eligible to supervise/co-supervise a student. Co-supervision may also be allowed from other Disciplines of Khulna University/other universities or research institutes.

viii) If a student has any grievance about a Supervisor, or if a Supervisor has any complaint against a student, s/he may inform the Discipline Head about the issue in writing. The Discipline will decide such matters.

ix) Pursuant to the leave rules of Khulna University, a Supervisor can remain absent from Khulna University (not more than six months) while continuing as a Supervisor. The online defense may be arranged in such cases if deemed necessary. Otherwise, the Co-supervisor (if any) or any other competent person will act as the Supervisor as per the guideline of the concerned Examination Committee. This will be applicable for projects and internships also.

x) Every student submitting a dissertation in partial fulfillment of the requirements of a degree will be required to appear at proposal presentation for Dissertation Part-I and defense board of Dissertation Part-II respectively on the dates fixed by the Discipline Head in consultation with the Supervisor(s). Such presentation and defense may be arranged online if deemed

necessary to the concerned authority. A student must satisfy the examiners that s/he is capable of undertaking independent work and affording evidence of satisfactory knowledge related to the theory and techniques used in his/her research work.

xi) A student must submit the required number of printed and soft copies of Dissertation Part-II in the approved format through the Supervisors to the Discipline Head by a date to be fixed by the Discipline. The Dissertation will not usually be considered for evaluation if the plagiarism detection system yields a similarity index of more than 25% (excluding bibliography/references, quotes, and small sources with source exclusion threshold of ten-word counts). This will be applicable to the dissertations written in English. The curriculum of the concerned program will provide a specific guideline on this issue.

xii) Each student shall certify that the research work is his/her own and that the work was not submitted elsewhere for any other degree or diploma - the entire work has not been published as a monograph or a book before the Degree is awarded.

xiii) If any change is required in the title/supervisor/co-supervisor/examiner/etc., the Discipline Head will send it to the BOAS through EC.

20.1.7 Credit Requirement and Duration of the Program

The required credits and duration for Master's Programs are mentioned below.

Program type	Credit Requirement				Program Duration			
	Coursework (Min.)	Dissertation (Min.)	Dissertation (Max.)	Total (Min.)	Term (Min.)	Year (Min.)	Term (Max.)	Year (Max.)
Coursework	40	-	-	40	02	1.0	06	3.0
Mixed-mode (Dissertation)	20	15	20	40	03	1.5	06	3.0

The details of each Term Duration will be as follows:

Item	Duration
Teaching and continuous assessment/ Contact with Supervisor	14 weeks
Preparatory leave before: Final Examination/ Seminar/ Defense	02 weeks
Final Examination/ Seminar/ Defense	(Maximum) 04 weeks
Term Break	02 weeks
Total	**22 weeks**

20.1.8 Course Types

The courses included in the Master's curriculum may be divided into three groups as follows:

(i) **Core Courses:** Core courses are obligatory for a degree.

(ii) **Optional Courses:** Any other courses students may undertake to earn the Degree.

(iii) **Major Courses:** A Discipline may offer courses from one or more major areas (if any), and after completing a certain number of credits from that area (as reported in the following table), a student can achieve a Master's degree with a major in a specified field, and that will be mentioned in the Transcript, e.g., MS in Agrotechnology (Horticulture). The curriculum of the concerned program will provide a detailed description of such cases.

Credit Requirements for Offering Major

Program type	**Min. credit requirement from major area***			
	Coursework (Min.)	Dissertation (Min.)	Dissertation (Max.)	Min. from Major Area
Coursework	20	-	-	20
Mixed-mode (Dissertation)	9	15	20	20

* For achieving a Master's degree with a major in a specified field under a mixed-mode or 'Master's by Research' scheme, the concerned dissertation must be directly linked with the 'major area' under consideration.

(iv) **Viva Voce:** A Discipline may include Viva Voce of 01/02 credit(s) at the end of each Term. The concerned Examination committee of that Term will conduct the viva and assess the students out of 100 marks.

(v) **Assignment of Credit:**

Theory Courses: For theory courses, one-hour face-to-face learning (e.g., lecture, tutorial, seminar) per week will be equivalent to one credit.

SessionalCourses: For sessional courses, 1.5-hour face-to-face learning (e.g., lab work, studio, fieldwork, or clinical work) per week is equivalent to 1.0 credit. For industrial/ workplace learning, 2-hour learning per week is equivalent to 1.0 credit.

In addition to face-to-face and other means of learning, online teaching-learning might be exercised if deemed necessary to the Discipline/POE.

20.1.9 Course Registration

(i) Each student will get oneself registered with the University. S/he will fill in the course registration form in consultation with the Program Coordinator under the guidance of the Discipline Head. The Program Coordinator will verify the form and submit it to the Discipline Head for forwarding it to the Registrar's office. Such submission might be made online, when and where applicable. The Registrar's office will be responsible for its distribution to relevant authorities (Disciplines and the Controller of Examinations). Course registration will be permitted within five working days at the beginning of each Term. Late registration will be permitted up to the next five working days on payment of a late fee. Student(s) having outstanding dues to the University shall not be permitted to register.

(ii) A student has to register for the backlog/retake/re-retake core courses first followed by the fresh courses offered by the Discipline for the term s/he is going to enroll subject to the compliance with: (i) completion of prerequisite courses (if any) and (ii) maximum credit registration limit per Term. However, s/he may not choose to register the optional backlog/retake/re-retake courses first.

(iii) A student may be allowed to register for advance course(s) in a term subject to: (i) his/her all backlog/retake/re-retake and offered core courses are either clear or registered, (ii) his/her current terms' offered all core courses are registered, (iii) completion of corresponding prerequisite courses (if any), (iv) compliance with maximum credit registration limit per Term, and (v) the desired advance courses are offered by the Discipline/POE in the current Term. However, such an advance course registration option will not be applicable for capstone courses like Thesis/ Project/ Internship/ and so on.

(iv) A student retaking/re-retaking the course will be awarded the immediate lower grade he/she obtains, and this grade will be shown and maintained on the Transcript.

(v) A Discipline/POE will not continue an optional course if less than 30 percent of students (of total seats for that batch) register for that course within ten working days from the beginning of classes. The situation will be solved by dropping that optional course through applying article 10.3 of MS Ordinance by the next five working days. The Coordinator will maintain such records and act accordingly. However, the concerned Discipline/POE might relax this clause for only final term/year optional courses if it is deemed necessary (for example, the studentship will be toward termination or the student will have to wait for additional term/year if the considered optional course(s) are not offered).

20.1.10 Limits on the Credits to be taken in a Term

Discipline Head may allow a student to register up to a maximum of 25 credits if recommended by the Program Coordinator. However, there is no minimum credit limit per Term in Master's level study.

20.1.11 Course Adjustment Procedure

A student will have the option to add or drop course(s) from his/her registration list within fifteen working days from the beginning of classes. This can be done with the advice of the concerned Program Coordinator and consent of the Discipline Head. Adjustment of initially registered courses in any Term can be made by duly filling in the Adjustment Form. The Registrar's office will do the needful.

20.1.12 Withdrawal from a Term

If any student cannot complete the Term Final Examination due to severe illness or serious accident, he/she may apply to the Dean through the Head for total withdrawal from the Term within eight working days after the end of the Term Final Examination. However, s/he may choose not to withdraw from any sessional courses if the grade obtained in such a course is 'C' or better. A medical certificate endorsed by the Chief Medical Officer of the University must support the application. The Dean of the concerned school will decide on such an application and inform the Registrar. If a student is allowed to withdraw from a Term, he/she will have to register as fresh for the Term he/she has withdrawn. However, he/she may be allowed to register for backlog courses, if offered.

20.1.13 Absence in a Term

A student may be absent from continuous assessments (quizzes/class test/field works, etc.) during the Term. Such absences will naturally reduce points/marks, which count towards the final grade. Absence in the Mid Term (if any) and the Term Final Examination will result in 'F' grade. A student who has been absent for short periods, up to a maximum of three weeks due to illness, should request the Course Teacher or Program Coordinator to makeup continuous assessments immediately on returning to the class. A medical certificate should support such request from the Chief Medical Officer of Khulna University. The medical certificate issued by registered medical practitioners (with the registration number shown explicitly on the certificates) and endorsed by the Chief Medical officer of the University will

also be acceptable only in those cases where the student has valid reasons for his absence from the University.

20.1.14 Special Term

Students having any retake/re-retake course(s) may apply for a special Term to complete the total required course (maximum 09 credits) in that Term. The special Term will be offered for the final term students who have retake/re-retake courses. The examination will start four (04) weeks after publication of the result and will continue not more than 2 (two) weeks. The marks of both attendance and continuous assessments will be carried over from the previous record.

20.1.15 Registration for Improvement

If any student gets a 'D' to 'C+' grade in any course, s/he may be allowed to repeat that course to improve the grade. The previous grade will be replaced from the grade sheet in such a case.

20.1.16 Backlog

If a student obtains an 'F' grade in any Core course in any term, this 'F' grade will not be counted for Grade Point Average (GPA) but will be shown on the grade sheet, and in such case, he/she will have to retake the course to complete the Degree. If a student does not register for an offered Theory or Sessional course in his/her applicable Term (for example, '0541 12 Math 5101' course in his/her Master's first year first term, '0541 12 Math 5203' course in his/her Master's first year second term, '0541 12 Math 6104' course in his/her Master's second year first term), that course will be considered as a 'Backlog' course for that student in the subsequent terms. If a student gets an 'F' grade in an Optional course, he/she may, subject to availability, choose to take an optional substitute course. In such a case, that substitute course will be deemed as a fresh course. In case of registering for a Backlog Theory or Sessional course, a student has to face/appear/attend 100 marks evaluation, like a fresh course.

20.1.17 Credit Transfer/ Credit Waiver

This ordinance permits credit transfer to facilitate educational mobility. That transfer of credit(s) may be inward or outward. In the case of outward credit transfer, a student of Khulna University has to apply to the Registrar through the Head of the Discipline/POE for getting a credit transfer certificate. The application must be supported by necessary documents, including a copy of the grade sheet(s). Accordingly, the Registrar will issue a credit transfer certificate mentioning the number of credits already completed at Khulna University.

In case of inward credit transfer, students from other Universities/ Institutions may apply to the Registrar of Khulna University for credit transfer. The application must be supported by necessary documents, including a copy of grade sheet(s) and curriculum. The Registrar's office will forward the application to the concerned Discipline/POE. A three-member committee headed by the Discipline Head and two senior most teachers will assess the application and recommend for approval to the Registrar. The maximum limit of credit transfer from other Universities/ Institutions will be less than or equal to 50 percent of the total credits required to complete the concerned Degree. The final transcript of such students will show only the number of credits transferred.

The same process may be applied for handling the credit waiver related applications. However, the maximum limit of inward credit waiver from other Universities/ Institutions should be less than or equal to 20 percent of the total credits required to complete the concerned Degree.

20.2 Grades

Grade related issues are reported in section 20.1.

20.3 Grade Point Average (GPA)and Cumulative Grade Point Average (CGPA)

a) Grade Point Average (GPA) is the weighted average of Grade Points obtained in all the courses passed/completed by a student. For example, if a student has passed/completed five courses in a term having credits of C1, C2, C3, C4, and C5 and his/her points in these courses are G1, G2, G3, G4, and G5, respectively, then,

$GPA = \sum CiGi/\sum Ci$

b) A Numerical Example: Suppose a student has completed five courses in a term and obtained the following grades:

COURSE	CREDIT	GRADE	GRADE POINT
A	3	A+	4.00
B	3	C+	3.00
C	3	A	3.75
D	2	B	3.25
E	1	B+	3.50

Then his/her GPA for the term will be computed as follows:

GPA= 3(4.0) + 3(3.0) + 3(3.75) + 2(3.25) + 1(3.5) / (3 + 3 + 3 + 2 + 1) = 3.52

c) A student's performance will be evaluated in terms of three indices- Term Grade Point Average (TGPA), Yearly Grade Point Average (YGPA), and Cumulative Grade Point Average (CGPA). The TGPA is computed by dividing the total points earned in a Term by the number of credits taken in the Term. The YGPA is computed by dividing the total grade points earned in two Terms in a year by dividing the number of credits taken in that year. The CGPA is computed by dividing the total grade points accumulated till date by the total completed credits. Thus a student who has earned 275 grad points in attempting 100 credits of courses would have an overall CGPA of 2.75.

20.4 Course Withdrawal

a) 'W' is the corresponding grade for withdrawn of a course, as mentioned in section 20.1.1.

b) If any student cannot complete the Term Final Examination due to severe illness or serious accident, he/she may apply to the Dean through the Head of the concerned Discipline for total withdrawal from the Term within eight working days after the Term Final Examination. However, he/she may choose not to withdraw from any sessional course if the grade obtained in such a course is C or better. A medical certificate endorsed by the Chief Medical Officer of the University must support the application. The Dean of the concerned School will decide on such an application and inform the Academic Council. If a student is allowed to withdraw from a Term, he/she will have to register as fresh from the Term he/she has withdrawn. However, he/she may be allowed to register for backlog courses, if offered.

20.5 Incomplete (I) Courses

'I' is the corresponding grade for an incomplete course, as mentioned in section 20.1.1.

20.6 Retake

Retake related issues are reported in section 20.1.

20.7 Grade Improvement

Grade improvement related issues are reported in section 20.1.

20.8 Dropout/Cancellation of Studentship

Dropout/Studentship cancellation related guidelines of the latest 'Ordinance for Undergraduate Examination' of Khulna University will generally be applicable for the Master's programs, if not conflicting with this Ordinance.

20.9 Publication of Results

(i) The Controller of Examinations will publish the result and preserve all the records for one year after the Degree is awarded. The result will be published subject to completing the required number of credits and fulfilling other requirements (for example, article/paper for 'Master's by Research' mode students) within the stipulated time limit, as applicable.

(ii) A student can have his/her results re-examined by applying to the Controller of Examinations within 30 working days from the date of publication of results. However, s/he has to pay a re-examination fee fixed by the concerned authorities. The Controller of Examinations will take necessary measures regarding the matter in consultation with the Chairman of the Examination Committee. Answer script re-scrutiny and result re-examination related rules of the latest 'Ordinance for Undergraduate Examination' of Khulna University will generally be applicable for the Master's programs also.

20.10 Subsequent Ordinances

For related/relevant issues, which are not covered (or not cleared) here, provisions of the latest 'Ordinance for Undergraduate Program' and 'Ordinance for Undergraduate Examination' of Khulna University may be consulted and applied, if not conflicting with this Ordinance.

Approval Records	
Approving Authority	Date of Approval
Curriculum Committee of the Discipline	08. 09. 2022
Executive Committee of the School	11. 09. 2022
BOAS (if applicable)	22. 09. 2022
Academic Council	
Syndicate (if applicable)	

Concerned Committee of the Discipline/POE (if applicable)			
Serial No.	Name and Address	Designation in Committee	Remarks
01	Dr. A.T.M Masood Reza, Associate Professor	Chairman	
02	Dr. Sifat Sarwar, Assistant Professor	Member	
03	Md. Azharul Islam, Assistant Professor	Member	
	Rumana Asad, Associate Professor	Member Secretary	

References

BAC 2021. Bangladesh Accreditation Council (BAC) Standards for Accreditation of Academic Program, BAC, Dhaka. pp.1-8.

Economics Discipline 2016. Curriculum for BSS (Hons) in Economics Program, Economics Discipline, Khulna University. pp. 1-190.

FWT Discipline 2022. Outcome Based Curriculum for Bachelor of Science (Hon's.) in Forestry, Forestry and Wood Technology (FWT) Discipline, Khulna University

IQAC 2022. Template of Outcome-based Curriculum, Institutional Quality Assurance Cell (IQAC), Khulna University. pp. 1-18.

KU 2022. Ordinance for Undergraduate Examination, Khulna University. pp. 1-13.

KU 2022. Ordinance for Undergraduate Program, Khulna University. pp. 1-16.

Law Discipline 2021. Program Specification and Curriculum of Bachelor of Laws (LLB Hons.), Law Discipline, Khulna University. pp. 1-120.

UGC 2020. Template of Outcome Based Education (OBE) Curriculum (Revised). pp. 1-8.

UGC 2021. Bangladesh National Qualifications Framework (BNQF) Part B: Higher Education (level 7-10). pp. 1-29.