Architecture Program

5 Years Structure

Architecture Program

School of Architecture and Design, KMUTT

Name of Program

Bachelor of Architecture Program in Architecture

Degree

Full name: Bachelor of Architecture, International Program

Abbreviate name: B. Arch. (Architecture), International Program

The Objectives of the Program

- To produce graduates with the knowledge and skills required to serve society and their country as a whole, with a strong awareness of the environment and the quality of life.
- To produce graduates with a high level of responsibility who can contribute greatly in different areas of architecture, research, and development.
- To produce graduates with a strong sense of moral ethics.

Program Duration

Completion of required credits for full-time program is to be made within a period of 10 semesters or 5 academic years, but not to exceed 20 semesters or 10 academic years.

Curriculum

Total Program Credits 160 credits

Curriculum Components

General Education Courses 24 credits

- Integrative Courses 15 credits
- Language Courses 9 credits

Major Courses 130 credits

- Fundamentals Courses 20 credits
- Core Courses 48 credits
- Technology Courses 30 credits
- Supporting Courses 23 credits
- Architectural Elective Courses not less than 9 credits

Free Elective Courses **not less than 6 credits**

Architectural Program

Year 1

First Semester

Code	*Course*	*Credit**
ARC 111	Design Drawing and Sketch	3(1-4-6)
ARC 117	Design Fundamentals I	4(1-6-8)
ARC 123	History of Art and Design	3(3-0-6)
LNG 221	Academic English in International Contexts	3(3-0-6)
GEN 121	Learning and Problem Solving Skills	3(3-0-6)
GEN 231	Miracle of Thinking	3(3-0-6)
	Total	**19(14-10-38)**

Second Semester

ARC 112	Digital Design	3(1-4-6)
ARC 125	History of Architecture	2(2-0-4)
ARC 141	Architectural Design I	6(2-8-12)
ARC 161	Building Materials and Construction Technology I	4(2-4-8)
LNG 222	Academic Listening and Speaking in International Contexts	3(3-0-6)
	Total	**18(10-16-36)**

Year 2

First Semester

ARC 226	History of Thai Architecture in Southeast Asian Context	2(2-0-4)
ARC 242	Architectural Design II	6(2-8-12)
ARC 262	Building Materials and Construction Technology II	4(2-4-8)
ARC 271	Structural Design I	3(3-0-6)
ARC 281	Environmental Technology I: Comfort Factors and Thermal Design)	3(3-0-6)
GEN 111	Man and Ethics of living	3(3-0-6)
	Total	**21(15-12-42)**

Second Semester

ARC 231	Theory of Architecture and Interior Architecture	3(3-0-6)
ARC 243	Architectural Design III	6(2-8-12)
ARC 263	Building Materials and Construction Technology III	4(2-4-8)
ARC 272	Structural Design II	3(2-2-6)
ARC 282	Environmental Technology II : Architectural Lighting and Acoustics	3(3-0-6)
	Total	**19(12-14-38)**

Year 3

First Semester

ARC 313	Advanced Digital Design	3(1-4-6)
ARC 344	Architectural Design IV	6(2-8-12)
ARC 354	Site Planning and Landscape Architecture	3(2-2-6)
ARC 383	Environmental Technology III : Building Service System	3(3-0-6)
GEN 241	Beauty of Life	3(3-0-6)
ARC xxx	Architectural Elective I	3(x-x-x)
	Total	**21(11+x-14+x-36+x)**

Second Semester

ARC 345	Architectural Design V	6(2-8-12)
ARC 352	Urban Planning	3(2-2-6)
ARC 394	Professional Practice	3(3-0-6)
ARC xxx	Architectural Elective II	3(x-x-x)
XXX xxx	Free Elective I	3(x-x-x)
	Total	**18(7+x-10+x-24+x)**

Year 4

First Semester

Code	*Course*	*Credit**
ARC 446	Architectural Design VI	6(2-8-12)
ARC 493	Construction Management	3(3-0-6)
ARC 495	Preparation for Cooperative Learning in Architecture	3(2-2-6)
GEN 351	Modern Management and Leadership	3(3-0-6)
ARC xxx	Architectural Elective III	3(x-x-x)
	Total	**18(10+x-10+x-30+x)**

Second Semester

Plan 1: Cooperative Learning

ARC 491	Cooperative Learning	6(0-35-18)
	Total	**6(0-35-18)**

Plan 2: Architectural Internship

ARC 496	Architectural Internship	3(S/U)
ARC xxx	Architectural Elective	3(x-x-x)
	Total	**6(x-x-x)**

Year 5

First Semester

ARC 501	Thesis Preparation	3(2-2-6)
LNG 321	Academic Reading and Writing in International Contexts	3(3-0-6)
XXX xxx	Free Elective II	3(x-x-x)
	Total	**9(5+x-2+x-12+x)**

Second Semester

ARC 502	Thesis	9(0-18-36)
ARC 593	Seminar	2(0-4-4)
	Total	11**(0-22-40)**

Course Description

General Education Courses 24 Credits

Integrative Courses 15 Credits

GEN 111 Man and Ethics of Living 3(3-0-6)
Prerequisite: none

This course studies the concept of living and working based on KMUTT's Mission to develop its students to be the best academically, to have morality and work ethics, and to demonstrate the KMUTT vision and mission through the use of knowledge and integrative learning approaches. Students will be able to gain KMUTT's desirable vision of the University such as, social responsibility, KMUTT Citizenship, professional skills, and to apply knowledge toward life in KMUTT and beyond for the benefit of themselves and others.

GEN 121 Learning and Problem Solving Skills 3(3-0-6)
Prerequisite: None
This course aims to equip students with the skills necessary for life-long learning. Students will learn how to generate positive thinking, manage knowledge and be familiar with learning processes through projects based on their interest. These include setting up learning targets; defining the problems; searching for information; distinguishing between data and fact; generating ideas, thinking creatively and laterally; modeling; evaluating; and presenting the project.

GEN 231 Miracle of Thinking 3(3-0-6)
Prerequisite: none
This course aims to define the description, principle, value, concept and nature of thinking to enable developing students to acquire the skills of systematic thinking, systems thinking, critical thinking and analytical thinking. The Six Thinking Hats concept is included. Moreover, idea connection/story line and writing are explored. Examples or case studies are used for problem solving through systematic thinking using the knowledge of science and technology, social science, management, and environment, etc.

GEN 241 Beauty of Life 3(3-0-6)
Prerequisite : None
This course aims to promote the understanding of the relationship between humans and aesthetics amidst the diversity of global culture. It is concerned with the perception, appreciation and expression of humans on aesthetics and value. Students are able to experience learning that stimulates an understanding of the beauty of life, artwork, music and literature, as well as the cultural and natural environments.

GEN 351 Modern Management and Leadership 3(3-0-6)
Prerequisite: none
This course examines the modern management concept including basic functions of management—planning, organizing, controlling, decision-making, communication, motivation, leadership, human resource management, management of information systems, social responsibility—and its application to particular circumstances.

Language Courses 9 Credits

LNG 221 Academic English in International Contexts 3(3-0-6)
Prerequisite: none
The course aims at developing the confidence and academic English skills necessary for learners in an international program. The learning and teaching involves the integration of the four language skills, thinking skills and autonomous learning. In terms of reading, the course focuses on reading for main ideas, summarizing skills, critical reading and interpretation skills through the use of real-world content. In terms of writing, the emphasis is on process writing and academic writing to enable learners to effectively use the information gained from reading to support their statements. In terms of speaking, the focus is on sharing opinion and exchanging information on issues related to the learners' content areas or their field of interest. In terms of listening, the focus is on listening to English talks and taking notes from authentic input.

LNG 222 Academic Listening and Speaking in International Contexts 3(3-0-6)
Prerequisite: none
This course aims at developing confidence and academic listening and speaking skills necessary for learners in an international program. The teaching and learning styles involve an integration of English into learners' content areas to enable them to think critically and communicate effectively. Learners will be able to listen to extended speech and lectures in their fields, share ideas and express opinions, conduct an interview for professional, collect data and present a survey project.

LNG 321 Academic Reading and Writing in International Contexts 3(3-0-6)
Prerequisite: LNG 222
The course aims at developing confidence and academic reading and writing skills necessary for learners in an international program. The teaching and learning styles involve an integration of English into learners' content areas to enable them to read academic articles in their chosen fields. Learners will be able to extract main points from the text, purposefully select required information to support their writing, write different forms of reports in their fields, use information obtained from reading and their own experience in writing an essay, and effectively use references and citations throughout the writing process.

Major Courses 130 Credits

Fundamentals Courses 20 Credits

ARC 111 Design Drawing and Sketch 3 (1-4-6)
Prerequisite: none
This course provides students with the fundamental skills and techniques to effectively communicate architectural ideas through drawings and sketches. Students will explore various drawing mediums and tools while developing their understanding of scale, proportion, and spatial relationships.
The course covers technical drafting techniques, including orthographic projection, metric drawings, perspective, shading, and composition. Additionally, they will be introduced to freehand sketching and rendering, enabling them to express architectural designs with appropriate textures and materials.
Learning Outcomes
1. Demonstrate proficiency in using various drawing mediums and tools for architectural representation by applying scale, proportion and rendering effectively.
2. Utilize technical drafting techniques, including orthographic projection, metric drawings, perspective, shading, and composition.
3. Interpret architectural drawings and sketches appropriately, developing observational skills to capture architectural forms and details

ARC 112 Digital Design 3 (1-4-6)
Prerequisite: none
This course aims to equip students with knowledge and proficiencies on digital tools requires to explore design and architectural concepts and develop techniques to present their work professionally and efficiently. Students will learn practical basics of 2D and 3D tools for making drawing and modelling work with introduction to parametric design and methodology of contemporary computational design approaches and develop skills in producing prototypes.
Learning Outcomes
1. Summarize basic knowledge of computational thinking logic as basis to develop coding skills.
2. Demonstrate skills to use computer software and digital fabrication tools to develop and express design concepts through effective computer drawings and efficient model making which reduces production time and material wastage.

ARC 117 Design Fundamentals I 4 (1-6-8)
Prerequisite: none
This course introduces the practical relevance of a set of nine design principles including Proportion, Asymmetry, Figure & Ground, Transformation, Chance, Dot/ Line/ Plane, Module, and Idea/Concept/ Reflexivity through structured day-length exercises in combinations of drawing, two-dimensions and three-dimensions. This class emphasizes on skills development, conceptual understanding and good working practice. The assessment is done via brief presentations and teacher advice.
Learning Outcomes
1. Demonstrate skill on generating design concept, idea development and design execution through design principles.
2. Demonstrate skill on brief presentations in combinations of drawing, two-dimensions and three dimensions.

ARC 123 History of Art and Design 3 (3-0-6)
Prerequisite: none
The ARC 123 course (The History of Art and Design) will take a global and thematic approach to learn art terms, uses, and applications through art histories by evaluating objects, architecture, and images. Students will contextualize historical work to other media, periods, and perspectives to help broaden a more global perspective and cultivate visual literacy. To strengthen critical inquiry skills, students will practice description, comparison, and analysis of historical works. This course aims to create a common visual vocabulary to discuss both content and ideas.
Learning Outcomes
1. Demonstrate and become familiar with a broad understanding of materials, mediums, and historical artworks
2. Conduct formal, stylistic, and historical analyses of images, objects, and architecture
3. Develop skills to translate visual material into written and verbal forms of communication using the English language and art and design-specific vocabulary.
4. Engage in critical thinking and connection-making through art and history.

ARC 125 History of Architecture 2 (2-0-4)
Prerequisite: ARC 123
Students learn to conceptualize architecture: definitions and ways in which it emerges; To think systematically about the three basic architectural components and their dynamic relationships based on case studies of historic buildings; To analysis multi-dimensional relationships between architecture and other sciences, technology and influential factors. Scope of content knowledge is limited to western architecture in western Europe and North America.
Learning Outcomes
1. To conceptualize the dynamic relationships of the 3 basic components of architecture; human need, structure system, and aesthetic within the context of historic architecture
2. To identify the sciences, technology, branches of knowledge, that related to creation of architecture in history
1. To write academic essay using secondary data in order to explain a historical development of the western architecture
2. Demonstrate personal drive to gain deeper knowledge in architecture through in-class activity and take full responsibility to complete the assignments.

ARC 226 History of Thai Architecture in Southeast Asian Context 2 (2-0-4)
Prerequisite: none
Students learn to conceptualize the relationships between Thai historic architecture and the influences of Indo-chinese ideology and also other cultures in Southeast Asia; to analyze architectural expressions and forms which reflect common culture, religious beliefs, tropical environments, and ways of living in

Southeast Asia. Scope of content knowledge revolves around historic architecture that exist in Thailand since prehistoric to 2475 BE.

Learning Outcomes

1. To conceptualize the dynamic relationships of Indochinese ideology, tropical way of living and Southeast Asian architecture.
2. To describe a historical development of architecture that exist in Thailand since prehistoric period to 2475BE.
3. To write academic essay using secondary data in order to explain a historical development Thai architecture in of Southeast Asian context
4. Demonstrate personal drive to gain deeper knowledge in architecture through in-class activity and take full responsibility to their assignment

ARC 231 Theory of Architecture and Interior Architecture 3 (3-0-6)
Prerequisite: none

A study of ways in which architects and their design processes are inspired and influenced by numerous factors. The course includes the analysis of architectural design concepts and philosophy from works of leading architects; impacts of economics and technology on construction materials; application of modern construction materials and techniques in the designs of contemporary architecture. The works of leading architects and designers; contemporary architectural design concepts; and interpretation of theories in architectural practice are introduced and discussed in the course.

Learning Outcomes

1. Identify the inspiration, context and criteria underlying the key architectural projects in different periods.
2. Discuss how theory informs architectural practices.

Core Courses 48 Credits

ARC 141 Architectural Design I 6 (2-8-12)
Prerequisite: ARC 117

The Fundamental Architectural Design course provides a comprehensive introduction to the principles and practices of architectural design. Building on the visual thinking approaches from Design Fundamentals ARC 117; this course aims to equip students with the necessary skills and knowledge to excel in architecture.

Students will explore materials, space, and construction throughout the course, developing a solid foundation in architectural design fundamentals. Emphasizing the relationship between architecture and human scale, students will understand how to create spaces that enhance human interactions and experiences in two-dimensional and three-dimensional contexts.

A series of carefully designed projects will serve as vehicles for students to engage in conceptual explorations and apply their ideas through practical means. In addition, students will acquire hands-on experience in translating their concepts into tangible architectural designs using analog and digital tools. This process will foster critical thinking, problem-solving, and creative skills, enabling students to navigate the complexities of architectural design effectively.

The course structure consists of a balanced mix of lectures and studio sessions. Evaluation methods will include project presentations, design critiques, and periodic assessments to assess students' progress and understanding.

Learning Outcomes

1. Describe and explain the fundamental architectural design principles, including the interplay between materials, space theory, and construction.

2. Explain the relationship between architectural design and human interactions in various spatial contexts.

3. Utilize analog and digital tools to translate conceptual ideas into tangible architectural representations.
4. Constructively critique architectural designs, providing thoughtful feedback based on design principles and human-centered considerations.

ARC 242 Architectural Design II 6 (2-8-12)
Prerequisite: ARC 141

This Architectural Design Studio II builds upon the foundational architectural design course from the first year, offering students a deeper exploration of complex and nuanced design challenges. The focus is refining students' understanding of specific conditions and developing effective working procedures that authentically express their ideas, considering internal and external factors such as socio-cultural aspects, human activities, spatial relationships, and contextual considerations. The course emphasizes the integration of design thinking methodologies and applying knowledge in building materials. Students will learn to respond appropriately to environmental conditions and develop skills in site planning. Studio lectures will cover various issues relevant to the projects. Upon completing this course, students can execute basic computer skills for design and presentation while demonstrating proficiency in design thinking, effective communication, and integrating building materials and structural knowledge into the design process for small to mid-raise types of buildings.

Learning Outcomes

1. Identify and analyze socio-cultural aspects, human activities, and environmental conditions relevant to architectural design.

2. Explain the relationship between user needs, site characteristics, and environmental conditions and effectively incorporate them into design solutions.

3. Generate design solutions for small-scale and mid-rise buildings that effectively address user requirements, site conditions, and environmental considerations.

4. Apply appropriate design methods and techniques to communicate ideas effectively through drawings, models, and other visual representations.

5. Utilize computer applications proficiently to support the design process and create professional-quality presentations.

6. Assess the appropriateness and effectiveness of design decisions with building materials, structural systems, and construction techniques.

ARC 243 Architectural Design III 6 (2-8-12)
Prerequisite: ARC 242

Architecture design emphasizing on extra-large public building or high-rise building. Students learn a systematic approach how to develop a comprehensive project, starting from precedent analysis, site and contextual analysis, user and stakeholder analysis, programing, building codes. Relevant information is integrated to develop an architectural concept leading to spatial organization (site plan, building form, floor plan and circulation) structural concept, exterior envelope, materials and construction details.

Learning Outcomes

1. Analyze and identify relevant contextual information, user's behavior, programing as well as legal constraints.

2. Develop an architectural concept, spatial organization and formal scheme responding to environmental, programmatic, technical, legal constraints as well as social and cultural context.

3. Develop structural concept, building systems and interior space planning corresponding architectural concept, spatial organization and formal scheme.
4. Communicate design process and outcomes verbally and visually, through drawings, diagrams, models and renderings.

ARC 344 Architectural Design IV 6 (2-8-12)
Prerequisite: ARC 243

Architecture design emphasizing on extra-large public building or high-rise building. Students learn a systematic approach how to develop a comprehensive project, starting from precedent analysis, site and contextual analysis, user and stakeholder analysis, programing, building codes. Relevant information is integrated to develop an architectural concept leading to spatial organization (site plan, building form, floor plan and circulation) structural concept, exterior envelope, materials and construction details. Advanced computer-aided design applications are incorporated in the design process.

Learning Outcomes

1. Analyze and identify relevant contextual information, user's behavior, programing as well as legal constraints.

2. Apply advanced digital technology as design tools to develop an architectural concept, spatial organization and formal scheme responding to environmental, programmatic, technical, legal constraints as well as social and cultural context.

3. Develop structural concept, building systems and interior space planning corresponding architectural concept, spatial organization and formal scheme.
4. Communicate design process and outcomes verbally and visually, through drawings, diagrams, models and renderings

ARC 345 Architectural Design V 6 (2-8-12)
Prerequisite: ARC 344

The studio design course offers students an immersive learning experience exploring diverse design directions. Through medium-scale projects, students engage with the complexities of architectural design, integrating a range of factors such as design process, tectonic formation, material construction, structural design, sustainable design, history and theory, regional and global contexts, social and cultural aspects, and urban considerations. Emphasis is on integrating relevant factors into architectural design, utilizing computer-aided software and hands-on methods/techniques.

The course builds upon students' previous design studio experiences, reinforcing design fundamentals, functional considerations, construction principles, and architectural concepts. In addition, practical communication skills are to articulate the translation of virtual design realms into physical realities. Studio lectures encompass a range of topics relevant to the projects, allowing students to choose from interest-driven studios.

Learning Outcomes

1. Evaluate and apply advanced concepts and specific issues relevant to contemporary or future architectural practices, critically analyzing topics concerning architectural design and proposing innovative solutions.
2. Synthesize and critically evaluate multiple design approaches and theories, drawing from diverse architectural precedents, contemporary trends, and emerging technologies, developing a comprehensive understanding of the context, constraints, and opportunities associated with their design projects.

ARC 446 Architectural Design VI 6 (2-8-12)
Prerequisite: ARC 345

The studio design course offers students an immersive learning experience exploring diverse design directions by integrating inputs from various stakeholders. Through medium-scale projects, students engage with the complexities of architectural design, incorporating multiple factors such as design process, tectonic formation, material construction, structural design, sustainable design, history and theory, regional and global contexts, social and cultural aspects, and urban considerations. Emphasis is on integrating relevant factors into architectural design, utilizing computer-aided software and hands-on methods/techniques when necessary.

The course builds upon students' previous design studio experiences, reinforcing design fundamentals, functional considerations, construction principles, and architectural concepts. In addition, practical communication skills are to articulate the translation of virtual design realms into physical realities. Studio lectures encompass a range of topics relevant to the projects, allowing students to choose from interest-driven studios while fostering their ability to collaborate effectively in multidisciplinary teams.

Learning Outcomes

Students completing this course will be able to:

1. Evaluate and apply advanced concepts and specific issues relevant to contemporary or future architectural practices, critically analyzing topics concerning architectural design and proposing innovative solutions.

2. Synthesize and critically evaluate multiple design approaches and theories, drawing from diverse architectural precedents, contemporary trends, and emerging technologies, developing a comprehensive understanding of the context, constraints, and opportunities associated with their design projects.

3. Utilize specialized knowledge and advanced technology/tools effectively to support the resolution of specific design problems or briefs, demonstrating proficiency in employing advanced software, equipment, and methodologies to develop and communicate their design solutions.

4. Generate detailed designs, specify appropriate materials, and employ suitable construction methods to address specific design problems or briefs.

5. Collaborate effectively in multidisciplinary teams to analyze complex architectural problems, integrate inputs from various stakeholders, and propose innovative design solutions considering social, environmental, and cultural aspects.

6. Present their ideas through compelling visualizations, presentations, and prototypes, demonstrating advanced proficiency in utilizing innovative design software, digital fabrication tools, and simulation techniques to effectively refine and communicate design concepts.

ARC 501 Thesis Preparation 3 (1-4-6)
Prerequisite: ARC 446

Thesis preparation is a study of research for architectural design. This will pave the way for the thesis design for the following semester. The course focuses on discovering one's own interests, conducting research on relevant factors, hypotheses, analyzing, and logical reasoning. Students will learn about the research process and practice gathering, analyzing, organizing, and summarizing data. Students will learn to develop a personal interest in topics and to analyze them. Students must be able to present their research methodology and data preparation for future thesis work, as well as proposed project architectural programming and design guidelines for their own thesis design part, at the end of the class.

Learning Outcomes

1. Students are able to be self-directed in the whole process of doing research, under the guidance of thesis advisors.

2. Students are able to formulate design approaches, define objectives, criteria and expected outcomes for their thesis.

3. Students are able to acquire, analyze, synthesize and organize information into a comprehensive manual for their design phase.
4. Students are able to deliver engaging, interesting and meaningful presentations of their research.

ARC 502 Thesis 9 (0-18-36)
Prerequisite: ARC 501

The thesis course continues from Thesis Preparation, which covered intensive research and study of the thesis and project proposal. The course focuses on linking the research findings from thesis preparation to the creation of concrete designs. Students must demonstrate architectural design capability, problem-solving skills, and design strategy through complete architectural design, including details and the architectural drawing standard. The outcomes must demonstrate an understanding and application of knowledge from various relevant subjects, as well as the ability to create and communicate project requirements and concepts to the physical design, production, and presentation, as well as the ability to use digital literacy to participate in the creation of works.

Learning Outcomes

1. Students can integrate all relevant and useful knowledge gained from research and analyze and apply it to architectural design.

2. Students can develop their own direction, process, and principles in architectural design, from conceptual design to schematic design and design development, in response to their thesis topic as well as practicality, rationality, and creativity.
3. Students can perform advanced presentation skills, such as visual language, architectural drawing, illustrating, digital visualization and presentation, model making, and so on.

Technology Courses 30 Credits

ARC 161 Building Materials and Construction Technology I 4 (2-4-8)

Prerequisite: **none**

This course introduces principal construction materials such as wood and masonry and their properties, i.e. physical characteristics, qualifications and proper applications for building construction. Wood substituted materials will also be introduced in the course. The course focuses on the principles of construction for wood and masonry for small to medium scale buildings. All building components: foundations, column, floor, wall, stairs, and roof will be covered through lectures, drafting projects, and field trips. Basic skills and technical drawing techniques, and conventional symbols of the materials will also be covered to develop the professional skills of students.

Learning Outcomes

1. Evaluate the properties and applications of wood, masonry, and other related materials in building construction.

2. Apply construction principles using wood and masonry for small to medium scale buildings.

3. Develop technical drawing skills for appropriate construction documentation.

4. Perform professionally on the ethical issues in architecture design and practice.

ARC 262 Building Materials and Construction Technology II 4 (2-4-8)

Prerequisite: ARC 161

This course is a continuation of Building Materials and Construction Technology I. The course introduces another set of principal construction materials, their characteristics and application such as concrete and steel. Small-scale construction techniques and building accessories will also be introduced in this course through reinforced concrete construction. The skills and technical drawing techniques will be conducted in building components such as: foundation, column, floor, wall, door & window, stairs, roof, as well as related building systems, with the introduction of the Building Information Modeling (BIM) approach.

Learning Outcomes

1. Evaluate the characteristics and applications of reinforced concrete construction.
2. Develop technical drawing skills for various building components and systems.
3. Summarize the Building Information Modeling (BIM) introduction and approach in the construction industry.
4. Demonstrate professionalism on the ethical issues in architecture design and practice.

ARC 263 Building Materials and Construction Technology III 4(2-4-8)

Prerequisite: ARC 262

Advanced construction technology, material focuses on non-structural building envelope and large scale building safety. Design principle that concerns seismic resistance will be covered in order to equip students with the basic knowledge of minimizing danger to building users and building damage.
Students will learn and practice the basic skills of construction drawing of steel structure and basic detailing. In addition to basic modeling, BIM is also used in quantity take-off and scheduling processes.

Learning Outcomes

1. Apply the advanced construction technologies and materials for building envelope and large-scale building safety.
2. Develop skills in construction drawing and basic detailing for steel structures including quantity take-off and scheduling by using Building Information Modeling (BIM)
3. Demonstrate professionalism on the ethical issues in architecture design and practice.
4. Evaluate the advancements in construction technology through self-learning.

ARC 271 Structural Design I 3(3-0-6)

Prerequisite: None

This course introduces the structural design and its application in architectural design. Fundamental engineering mechanics and structural analysis are considered including the system of forces, stability and equilibrium of structures, structural systems, structural loads, load transfer mechanism, and analysis of simple trusses, beams, and frames. An introductory study of the mechanics of materials and properties of construction materials such as structural steel, timber, reinforced concrete, and composite materials is discussed. Behaviors of the materials under loads are investigated such as elasticity, deformation, and buckling of the compression member. This course introduces the typical structural members of buildings which are structural foundations, columns, walls, beams, floors, and roof structures. Examples are drawn from either existing buildings or students' design projects.

Learning Outcomes

1. Determine the stability and quantify forces and moments acting on a structure in equilibrium.
2. Identify the fundamentals of structural elements, stresses and strain, and concepts for determining the safety of simple structural members.
3. Define the structural loads and transfer them to the supports by expressing load path or approximate numerical calculation.

ARC 272 Structural Design II 3(2-2-6)

Prerequisite: ARC 271

The course emphasizes the engineering qualities of building components, such as structural foundations, columns, walls, beams, and floors. Each component is considered according to the materials from which it was made. Students will learn a variety of construction methods, construction detailing, and appraisals of components in terms of engineering, functional performance, aesthetics, and construction. The course also quantifies the approximate size of visible structures and discusses the advantages and disadvantages of structural systems and building components made from different materials. Advanced structural designs, such as multi-story buildings, long-span structures, and structural designs in case of fire,

are included. Examples are drawn from existing buildings or students' design projects.

Learning Outcomes

1. Select appropriate structural systems and materials that suit their architectural design and meet the building performance requirements, such as strength, durability, and structural stability.

2. Analyze, qualitatively design, and quantitatively design vertical structural components including structural foundations, load-bearing walls, and columns.

3. Analyze, qualitatively design, and quantitatively design horizontal structural components including structural beams and slabs.

ARC 281 Environmental Technology I: Comfort Factors and Thermal Design 3 (3-0-6)

Prerequisite: None

Concept of carbon footprint and importance of sustainable design are introduced. The main focus is on comfort factors and thermal control. Psychometric Chart is used as a tool. Heat gain factors include internal and external, as well as solar geometry, sun-earth relationship, and solar impact on buildings. Concepts of passive and active design include orientation and site design fundamentals, zoning and layout strategies, effects from landscape and surroundings, shading design and effect of natural ventilation. Thermal performances of building components are introduced such as heat transfer modes, K, U value, SC, SHGC, OTTV and RTTV.

Learning Outcomes

1. Aware of Carbon footprint and SDGs
2. Evaluate and achieve principles of sustainable design
3. Design to achieve Thermal Comfort
4. Be able to justify passive and active design strategies.
5. Design and evaluate design with respect to Building Energy Code (BEC), OTTV, RTTV
6. Apply Building Material properties and be able to create their own wall section and performance such as Color, Reflectance, absorbance and transmittance, U value, K value, SC, SHGC, visible transmittance, thermal transmittance.
7. Summarize Basic A/C regarding air quality

ARC 382 Environmental Technology II: Architectural Lighting and Acoustics 3 (3-0-6)

Prerequisite : ARC 281

This course introduces students to the basic physical principles, design implications and performance of environmental design focusing on the behavior of light and sound within and around buildings. The study covers relevant aspects of artificial light, daylight and acoustics that affect the psychological and physiological experience of buildings, performance metrics, and design strategies to equip students with the ability to design and modify the building fabric to enhance the environmental performance of designed spaces. The lighting study also includes lighting systems, lighting efficiency, lighting for a variety of building types, and different constraints of lighting concerning atmosphere and visibility. Energy management for lighting in buildings with reference to user's requirements, electrical circuit, equipment and health and safety issue. The second part of the course studies acoustics and architecture. It includes a study of nature of sound, sound quality and the influence of sound on architectural design: Noise control and protection for interior space and open-air environment, propagation of sound, noise reflection and absorption, applications of the knowledge on architectural design.

Learning Outcomes

1. Summarize the fundamental design concept of daylighting and electrical lighting

2. Evaluate the principles of daylighting, lighting technologies in buildings which are related to architectural space

3. Summarize the key areas in lighting ranging from human factors through fundamental definitions to lighting design calculation

4. Implement daylighting and electrical lighting design to buildings

5. Integrate lighting design to buildings with concerning in energy conservation

6. Summarize the fundamental design concept of acoustic design

7. Evaluate the relationship between human perception and acoustic qualities in and around buildings

8. Summarize the key areas in acoustic design principle for different types of architectural spaces

9. Implement acoustic design to buildings
10. Integrate the design of building systems into architecture with highly concern in effectiveness.

ARC 313 Advanced Digital Design 3(1-4-6)

Prerequisite: ARC 112

This course focuses on using parametric and mathematical tools to develop complex architectural design and incorporating advanced simulations and testing to assist project development and integrating relevant knowledge such as BIM modelling, environmental technology and structure. Various experimental architectural design tools and approaches such as application of Augmented and Virtual reality (AR and VR), Artificial Intelligence (AI) and machine learning can be explored based on individual interests and responding to changing global climates and technologies.

Learning Outcomes

1. Apply coding skill into developing architectural design
2. Perform computational proficiency to explore up to date computer design options suitable to their projects and personal interests to enhance their building design and presentation.
3. Analyze and evaluate softwares to the design options and workflow into production using appropriate architectural drawing softwares.

ARC 383 Environmental Technology III: Building Service Systems 3(3-0-6)

Prerequisite: ARC 282

The course provides an overview of building technology systems and their integration into architecture. The focus is on imparting basic knowledge about building

technology systems in the Thai context, such as electrical installations, plumbing installations, mechanical transport systems, HVAC systems, fire protection measures in buildings, methods for communication, IT, building automation, performance control, and waste management in buildings.
In addition, practicable planning methods and detailing techniques for integration into building systems, such as building structure, building envelope, or spatial separation, are examined. Finally, as part of considering different system types and equipment, aspects of resource efficiency within buildings will find emphasis in this course.

Learning Outcomes

1. Analyze the significance of building technology systems and other components as integral to architectural design and planning.
2. Apply fundamental knowledge and concepts of related building services to integrate them into the architectural design and planning process.
3. Utilize appropriate assessment, calculation, or rule-of-thumb methods for early architectural design application of building service knowledge.
4. Create a proficient level of integrated system design in buildings using BIM (Building Information Modeling).
5. Evaluate the general impact of building service design applications and the importance of striving for resource efficiency.

Supporting Courses 23 Credits

ARC 352 Urban Planning 3 (2-2-6)

Prerequisite: none

This course is designed to provide students with an understanding of the world's urban situation and trends as a global citizen. Students will learn how to identify urban issues and problems and plan solution directions using cases and spatial data. Upon completion of this course, students will be able to critically analyze urban issues and problems, develop solutions based on spatial data and case studies, and communicate their findings effectively.

Learning Outcomes

1. Understand world urban situation and trends
2. Identify urban issues and problems
3. Plan solution directions using cases and spatial data

ARC 354 Site Planning and Space Planning 3 (2-2-6)

Prerequisite: none

Definition of Site Planning and its application for the architectural student. Definition of Landscape Architecture, and introduction and basic application. Fundamental knowledge of Site Planning about site factors about man-made, natural and aesthetic quality as site context. Conducting process of site planning from site investigation, analysis, synthesis, to design related to architecture, linking knowledge of civil engineering, landscape architecture, and city planning. Analyzing of various physical & natural aspects of site such as climate, landform and topography, slope analysis. Assisting the formation of proper architectural program. Linking the design of architecture and interior space to outdoor atmosphere at basic level. Integrating definitions of landscape architecture and methodology to understand open space atmosphere. Basic knowledge of plant materials and their physical aspects for designing landscape architecture.

Learning Outcomes

1. Identify landscape profession, its role and the relationship between design professions.

2. Summarize information taught in theory series; human behavior, planting design, landscape & garden style, design and principles, environmental concerns and responsibility, landscape technique and site design.

3. Relate information through creative and analytical thinking process to site planning skill which involve human and site analysis, site circulation design, building cluster, and design on sensitive environment to actual situation.

4. Perform professionally, collaboratively in group or individual work.

5. Communicate and present both in Thai and English, verbally and graphically.

ARC 394 Professional Practice 3 (3-0-6)

Prerequisite: none

This course is designed to provide learners with a comprehensive understanding of the principles, processes, and ethical considerations involved in the practice of architecture. It aims to equip aspiring architects with the knowledge and skills necessary to navigate the complexities of the architectural profession and successfully engage in professional practice. Throughout the course, learners will delve into various topics, including legal and regulatory frameworks, project management, contracts and agreements, ethical responsibilities, and business development.

Learning Outcomes

1. Summarize the role and responsibilities of architects in professional practice, including their ethical obligations and commitment to public health, safety, and welfare.
2. Demonstrate knowledge of the legal and regulatory frameworks governing architectural practice, including licensing requirements, building codes, and zoning regulations.
3. Analyze and interpret contracts and agreements commonly used in the practice, and effectively negotiate terms and conditions to protect the interests of all parties involved.
4. Recognize and navigate ethical dilemmas and make informed decisions that align with professional standards and promote sustainability, inclusivity, and social responsibility.
5. Develop and implement business development strategies to identify and pursue professional opportunities in the architectural and architecture-related industries including marketing, networking, and client relationship management.

ARC 493 Construction Management 3 (3-0-6)

Prerequisite: none

Studies include introduction to professional ethics and legal aspects, which include codes of ethics and conducts, architect's responsibilities, the evolution of the profession and today's career options, construction planning and control by critical path method, etc. Laws involving architectural practice; namely, building controls and professional controls.

Others may involve zoning, environmental protection, and energy conservation laws, liability in faulty design involved with tort and criminal law, contract laws and regulations, building regulations with history and intent of regulations.

Learning Outcomes

1. Summarize information taught in the theory series; impact of construction industry, fundamental construction management, contract types, bidding and award, project cost, time and quality control, disputes and claims, settlement and arbitration, research & development (R&D) and project case study.

2. Relate information through writing, diagram, illustration, or other materials or see its fullest implications.

3. Identify and solve problems individually or within a group.
4. Aware to perform professionally on the ethical issues involved in the formation of professional judgments in architectural practice.

ARC 495 Preparation for Cooperative Learning in Architecture 3 (2-2-6)
Prerequisite: none
The course is for students about to embark on their off-campus Cooperative Learning (CL) experience. This course provides students with the necessary skills and knowledge to apply, prepare and work effectively in a cooperative learning environment.

Students will learn to identify their interests in architecture and how to conceptualize and produce digital and analog work sample portfolios that highlight their strengths and abilities. They will learn how to synchronize their interests with available working places and create and send out applications that present their qualifications and aspirations. This course will also help students develop the necessary skills to collaborate effectively with others during their Cooperative Learning experience. Students will learn to communicate effectively, manage conflicts, and develop team-based problem-solving skills.

Overall, the course aims to equip students with the skills, knowledge, and confidence to navigate architecture's competitive and dynamic world and succeed in their Cooperative Learning experience. In addition, students will better understand the role of Cooperative Learning in their professional development and the tools and strategies necessary to work effectively in a professional environment.

Learning Outcomes

1. Identify interests in the architecture field and translate them into a professional portfolio of work samples.

2. Synchronize interests with available working places for the anticipated cooperative learning and internship experience.

3. Develop effective communication and collaboration skills to work in a team-based environment.
4. Produce a Cooperative Learning and internship application that presents to the standard qualifications and aspirations effectively.

ARC 491 Cooperative Learning 9 (0-35-18)
Prerequisite: ARC 446
This course requires students to participate in architecture design-related industries according to individual interest for four months by having clear objective on what knowledge or experience that they expect. It allows students to see the working process in different organizations to develop responsibility and self-confidence from working with other people, to accumulate knowledge and direct experiences needed for their architectural design project in the final semester. At the end of the program, students will be able to decide what kind of work they would like to participate in after graduation. Students should also be able to share their knowledge and experience from working the professional environment to others.

Learning Outcomes

1. Apply all the skills and knowledge in architectural design that they have studied in professional works through the four months periods in the real workplace.

2. Develop personal skills that are required to become an architect in the architectural-design fields related to individual interest.

3. Communicate and present the knowledge and experiences that they received during the work to others.

ARC 496 Architectural Internship 3(S/U)
Prerequisite: ARC 446

Supervised field experience in architectural offices. Understanding the practice of Architecture. Minimum of 2 months full-time internship in architecture or relevant design office.

Learning Outcomes

Develop responsibility and self-confidence from working with other people and will be able to perform professionally from participation in architecture design-related industries according to individual interest for two months.

ARC 593 Seminar 2 (0-4-4)
Prerequisite: none

The course provides students with the opportunity to discuss and analyze a variety of innovative ideas and concepts with their classmates, instructor, and industry professionals to develop teamwork skills, broaden students' perspectives on design-related topics, and cultivate and build relationships among them. Students will also practice searching for knowledge or interesting topics, sharing, and exchanging ideas and information, and analyzing and synthesizing multiple inputs.

Learning Outcomes

1. Acquire lifelong learning by searching for knowledge and interesting topics, and they can customize their own knowledge and information for discussion based on their individual interests.

2. Develop active learning skills, communication skills, networking abilities, and teamwork abilities.
3. Deliver engaging, interesting, and meaningful presentations on topics of interest and organize a knowledge-sharing event for students, designers, and those interested in architecture and design.

***Architectural Elective Courses
Not less than 9 Credits

ARC 329 Analysis of Contemporary Architecture 3 (2-2-6)

Prerequisite: none
This course offers learners a comprehensive exploration of the theories, concepts, and methodologies employed in the analysis and critique of contemporary architectural works. Through a combination of theoretical discussions, case studies, site visits and critical examinations of notable architectural projects, learners will develop a nuanced understanding of the social, cultural, and technological contexts that shape contemporary architectural design. This aims to develop learners' analytical and critical thinking skills, enabling them to assess and interpret the formal, spatial, and experiential qualities of architectural works. Learners will examine the influences, inspirations, and philosophies that inform contemporary architectural practice, as well as the impact of environmental, economic, and socio-cultural factors on the built environment.

Learning Outcomes

1. Apply various analytical methods and tools to interpret and evaluate the formal, spatial and experiential qualities of contemporary architectural works.
2. Develop effective critical thinking skills to formulate and articulate well-founded arguments and opinions about contemporary architectural works, considering factors such as context, programmatic requirements, sustainability, aesthetics, and social impact.
3. Communicate effectively and professionally through written assignments, research papers, presentations, and class discussions, demonstrating the ability to convey complex architectural analyses and ideas.

ARC 330 Analysis of Western and Architecture
Prerequisite: none **3 (2-2-6)**

This course offers learners a comprehensive exploration of the theories, concepts, and methodologies employed in the analysis and critique of contemporary architectural works. Through a combination of theoretical discussions, case studies, site visits and critical examinations of notable architectural projects, learners will develop a nuanced understanding of the social, cultural, and technological contexts that shape contemporary architectural design. This aims to develop learners' analytical and critical thinking skills, enabling them to assess and interpret the formal, spatial, and experiential qualities of architectural works. Learners will examine the influences, inspirations, and philosophies that inform contemporary architectural practice, as well as the impact of environmental, economic, and socio-cultural factors on the built environment.

Learning Outcomes

1. Apply various analytical methods and tools to interpret and evaluate the formal, spatial and experiential qualities of contemporary architectural works.
2. Develop effective critical thinking skills to formulate and articulate well-founded arguments and opinions about contemporary architectural works, considering factors such as context, programmatic requirements, sustainability, aesthetics, and social impact.
3. Communicate effectively and professionally through written assignments, research papers, presentations, and class discussions, demonstrating the ability to convey complex architectural analyses and ideas.

ARC350 Professional Communication and Presentation 3 (2-2-6)

Prerequisite: none
The content of this course is comprised of two different yet closely interrelated parts: visual and verbal presentation. The visual part introduces various tools and techniques for visual presentation including building up image library, mood board, material catalogues, diagramming technique, and presentation lay-out and composition. The verbal part includes how to organize the content and put it in a clear and comprehensible order, selection of information, preparation of space and equipment, and how to handle criticism.

Learning Outcomes

1. Communicate professionally and apply relevant software to prepare and produce visual presentation materials.
2. Develop professional verbal presentation skill in English and conduct themselves professionally in architectural design and practice.

ARC351 Sustainable Urban Management 3 (3-0-6)

Prerequisite: none
The class provides basic knowledge of architecture and urban planning in the context of sustainable urban management. It aims to provide students with knowledge and skills to manage sustainable urban development. Students will learn about the principles of sustainable development, the role of urban planning in sustainable development, and how to apply these principles to real-world situations. The course will also cover topics such as environmental sustainability, social sustainability, economic sustainability, and governance.

Learning Outcomes

1. Analyze urban development issues and problems.
2. Propose solutions that are socially, economically, and environmentally sustainable while aware of the world politics, limited resources, and class division.

ARC353 Creative Community and City 3 (3-0-6)

Prerequisite: none

An introduction to new terms of global competition which revolve around a nation's (community's) ability to mobilize, attract, and retain human talent by building creative community and city. Case studies of contemporary solutions to critical issues of crime, health, traffic, environmental degradation, and economic vitality around the world are reviewed. The relationship of architecture, urban space design and creative urban development is suggested.

Learning Outcomes

1. Summarize the creative industry and economy and the impact to urban realm.

2. Evaluate how city planning could play a significant role in creating conditions that attract people in the creative industry and the emerging of creative city/ community.

ARC356 Landscape Architecture II 3 (2-2-6)
Prerequisite: none

This course emphasizes the profession of Landscape Architecture and its role site planning and landscape architecture that involve more complicated factors of human behavior, social, cultural, and urban contexts. The complexity of site engineering, site drainage system, ecological system, local community. Vehicular and pedestrian circulation. Designating different structures by selecting and analyzing a site, forming a land use plan. Theory and history of landscape architecture. Aspects of park system and urban space atmosphere are the crucial topics for creating the design that unify architecture, human and all aspects of nature together seamlessly. Readjusting the existing landform design grading, providing proper drainage.

Learning Outcomes

1. Identify the role and scope of work of Landscape profession, its role and the relationship between design and planning.

2. Perform professionally in designing landscape site plan which responded to basic factors of human behavioral, social, cultural, and urban contexts

3. Demonstrate the understanding of basic landscape construction.

ARC 358 Design for Sustainable Tourism Development 3(2-2-6)
Prerequisite: none
The course will emphasize the idea and concept of sustainable development that supports the tourism industry and environmental awareness concerns. The course will cover the definition and concept of sustainable development, suitability study of factors related and the exploration of planning and/or design that is suitable for tourism development in valuable socio-environmental areas. The course will study the real case.

Learning Outcomes

1. Investigate and engage in knowledge (and information) exchange with stakeholders with empathy.
2. Develop sensitivity in observing, listening, and critical thinking about cultural and landscape geographical value.
3. Describe ideas and concepts, plan for sustainable tourism development, and evaluate the suitability of factors related in valuable socio-environmental areas.

ARC 420 VERNADOC: Vernacular Documentation
Prerequisite: none 3(1-4-6)
This course focuses on a methodology for vernacular architecture study. It emphasizes the collection of data and information on site by basic techniques. In addition, VERNADOC method includes architectural details of historic wooden structure through measuring the buildings, communicating, and documenting by drawing technique on paper with details including texture, materials shade, and shadow.

Learning Outcomes

1. Collect data and information on site by basic techniques for vernacular

Architecture study

2. Produce architectural drawing, architectural details of historic wooden structures with precise and realistic detail.

ARC 430 Film and Architecture
Prerequisite: none 3(2-2-6)
The course is a brief introduction into the history of cinema outlining key movements such as German Expressionist cinema of the 30s, Italian Neorealism, French New Wave, New Hollywood of the 70s, as well as influential figures who helped shape the seventh art such as Sergei Eisenstein or Buster Keaton. Following lectures on basic filming, film editing techniques will be introduced.

Learning Outcomes

1. Outline the key movements and history of cinema.

2. Assimilate, comprehend, discuss, share, and exchange ideas from the cinema.

ARC 432 Computational Design and Digital Fabrication 3(1-4-6)
Prerequisite: none
The course aims to introduce the concepts and applications of computation in architecture and design. It aims to provide the basic skills to build and control parametric models, analysis tools and introduction to the basic machine operation of the fabrication tools such as laser cutter, CNC, and rapid prototyping and how it may relate to the contemporary architectural discourses in the form of design tools and interactive presentations.

Learning Outcomes

1. Summarize computational design and digital fabrication through theory lectures on 3D modelling and computer coding for architectural design using up to date softwares.
2. Make continue flow of design production from digital to analogue by using fabrication tools available.
3. Demonstrate practical knowledge and model making skills through assignments using lab facilities and be able to use digital fabrication tools safely and efficiently.

ARC 436 Architectural Conservation: An introduction 3 (1-4-6)
Prerequisite: none

Study the basic concepts of architectural conservation and their applications in Europe and Thailand. Analysis of value in historic architecture, group of buildings, space and community based on the rationales behind the international conservation charters (UNESCO). Applying principles of architectural conservation to formulate project proposals which relate to architecture of cultural and historical values.

Learning Outcomes

1. Choose appropriate conservation charter for the building to be conserved in order to explain the rationale behind the acts of conservation
2. Formulate a project brief that correspond to architectural conservation and specific context of the buildings.

ARC 451 Special Topic Study I 3 (1-4-6)
Prerequisite: none

Special study about an architecture topic that is adjusted to individual needs.

Learning Outcome
Problem solving and be able to analyze and apply knowledge and information from given topics to reports or design.

ARC 452 Special Topic Study II 3 (1-4-6)
Prerequisite: none

Special study about an architecture topic that is adjusted to individual needs.

Learning Outcome
Problem solving and be able to analyze and apply knowledge and information from given topics to reports or design.

ARC 453 Special Topic Study III 3 (1-4-6)
Prerequisite: none

Learning Outcome
Problem solving and be able to analyze and apply knowledge and information from given topics to reports or design.

ARC 454 Architecture and Human Rights 3 (3-0-6)
Prerequisite: none
This course will examine the relationship between architecture and human rights and what it will mean for the future of the practice of architecture, planning and engineering. By first reviewing post-WWII Human Rights Law, the course will undertake a brief analysis of modern architectural history from a rights perspective and then develop a set of principles that can be used in practice. Finally, students will study several applications of these principles of international human rights law in design practice.
Learning Outcomes
1. Describe the relationship between architecture practice of architecture and human rights
2. Discuss the principles and application of these principles in design practices.

ARC 455 Computer in Architectural Design
Prerequisite: none **3 (1-4-6)**

The use of computers in architectural design, exhibition, communication and searching of various methodologies that could be applied in the design process by emphasizing in the creation of architectural space.

Learning Outcomes

1. Summarize and can use computers to explore architectural design and produce professional communication materials.

2. Summarize workflow and computer application through lectures and assignments.

ARC 456 Building Information Modeling 3 (2-2-6)

Prerequisite: none

This course introduces Building Information Modeling (BIM) and tools for parametric building design and documentation. The course offers hands-on exercises, concepts of BIM through the modelling of a basic building, from creating the building to making form, window/door, materials, room schedule, and shadow studies as well as rendering including generating documentation at professional level.

Learning Outcomes

1. Apply structural and construction knowledge to build comprehensive models

2. Produce professional architectural drawing sets by BIM software.

3. Able to organize workflow of production of construction drawing set and coordination with other disciplines.

ARC 457 Housing 3 (2-2-6)
Prerequisite: none
The study focuses on standards and classifications of residential units, including the procedure, regulations, and guiding concept in proving living accommodation for the community. The study includes problems affecting peoples' accommodation both in urban and rural areas. Instruments, building codes, occupancy standards, and zoning by-laws are examined.
Learning Outcomes
1. Summarize the housing design principles, theories and concepts and design guidelines.
2. Gain working experience with the community and stakeholders.
3. Summarize the participatory design process and community involvement, along with some exposures to the fieldwork study.
4. Awareness of the architect/designer's broader role in society, especially for the urban poor, marginalized and underprivileged group of people.

ARC 459 Exploring Narrative and Art in Residential Design 3 (3-0-6)
Prerequisite: none
This cross-disciplinary elective course delves into the fusion of narrative and art within contemporary residential design, combining theory and practice to enhance the quality of life. Through 15 lectures divided into three key topics, you will gain a comprehensive understanding of the field.
Design Theory and Concepts: Analyze influential case studies, including Narrative Design Theory and Descriptive Programming in Architectural Space Design, to explore major movements in house design concepts. Gain insight into the theoretical foundations and design principles that drive success.
Present Design Movements: Examine topics like the Aging Society, Energy Plus Design, and Sustainable Design that directly impact new proposals in residential design. Engage in discussions to understand their influence on shaping innovative solutions.
Current Trends: Explore emerging trends in residential design, such as A Modular House Design by Muji, the Micro-living trend, and ADU - Accessory Dwelling Unit or Plug-in House. Gain foresight into the future direction of the field.

Through collaboration, critical thinking, and practical exercises, you will develop a nuanced understanding of integrating narrative and art to create meaningful residential spaces. By analyzing case studies and participating in interactive discussions, you will gain the skills to design captivating, purposeful, and inclusive environments.

Learning Outcomes

1. Analyze: Apply narrative theory to evaluate its effectiveness in supporting residential design.
2. Evaluate: Assess the suitability of different media in addressing the concept of human engagement in domestic spaces.
3. Understand: Explain the relationship between design movements and social demands, considering various living conditions in contemporary issues.
4. Evaluate: Critically evaluate the relevance of future residential design solutions from case studies to the Thai context.

ARC 461 Building Materials and Construction IV **3 (2-2-6)**

Prerequisite: none

To study the principles in making architectural detailing documents and detailing schedule of various building types. Preparation of architectural accessories and presentation technique.

Learning Outcomes

1. Summarize information taught in the theory series; site details - concrete curb and walkway, building envelope details – external wall and facade, lightweight partitions details, reflected ceiling, vertical transportation details – stairs, lifts and escalator, toilet details, materials specifications, schedules – finishing, door, sanitary ware, fitting and accessories.

2. Relate information through writing, free-hand sketch, hand drawn drawing skills; or other material, or see it fullest implications.

3. Identify and solve problems individually or within a group.

4. Aware to perform professionally on the ethical issues involved in the formation of professional judgments in architectural practice.

ARC 462 Prefabricated Design and Construction
Prerequisite: none **3 (1-4-6)**

This course is a study about prefabricated design and construction. Specific materials and construction methods are introduced and discussed along with building systems. Students will also gain essential understanding of construction methods through field trips to fabrication facilities and construction sites.

Learning Outcomes

Recognize basic prefabricated construction processes, materials, benefits and constraints of these construction methods including how they are implemented in architectural practices.

ARC 464 Supervision of Construction **3 (3-0-6)**
Prerequisite: ARC 263

The course is intended to be a guide for those new to supervising construction works. Supervision is the link between design and construction, making the transition from the theoretical to the practical by attempting to demonstrate how standards of design and specification developed on design office are on the site.

Learning Outcomes

1. Summarize information taught in theory series; construction supervision and project spirit, site investigation, demolition, site hygiene, health and safety, record and report, temporary and permanent work, specialist construction, progress payment, minute of meeting, defect liability, project final acceptance.

2. Relate information through writing, record and report skill, diagram, illustration, sketching drawing, or other materials, or see its fullest implication.

3. Identify and solve problems individually or within a group.
4. Perform professionally on the ethical issues involved in architectural practice.

ARC 484 Environmental Technology IV: Energy-Efficient Building Design Techniques and Simulation

Prerequisite : ARC 383

This course offers a comprehensive exploration of resource-efficient building design techniques and evaluation, focusing on sustainable approaches and the role of architects in assessing crucial indicators. Students will delve into critical topics such as resource depletion, environmental pollution, health issues, climate change, global warming, and natural disasters, understanding their profound impact on the built environment. Through this course, students will understand the significance of conserving resources and the definition and strategies of sustainable buildings. They will also examine the latest developments in building resilience, considering the importance of designing structures that can withstand unforeseen challenges.

Students will employ appropriate evaluation methods and use standards and simulation techniques to assess and evaluate the effectiveness of resource conservation in buildings. The emphasis will be on minimizing non-renewable resources while adhering to building codes, standards, and regulations.

Learning Outcomes

1. Investigate and evaluate the key factors that impact building resource consumption by conducting independent research, proficiently employing available design/software tools, and developing practical solutions.

2. Comprehend the significance of architects and assess the influence of design on overall building performance by analyzing case studies and real-world examples.

3. Demonstrate critical thinking skills by interpreting complex information, effectively communicating research findings, and conducting computer simulations to analyze and optimize integrated building performance.
4. Explain the economic fundamentals associated with building design and articulate the concept of life cycle thinking while identifying potential improvement opportunities through various design strategies.

ARC 492 Building Cost Estimation **3 (3-0-6)**

Prerequisite : None

Studies include introduction into organizational and financial concerns for buildings; interior architects, architects, engineers and builder's relationships; organization of their work; studies of cost estimation according to material prices, wages, instrument, and management costs in several types of buildings. It will also include studies of other factors that influence initial costs such as construction contract liability, special specification contact liability, special specifications, and labor.

Learning Outcomes

1. Summarize information taught in the theories series; building economics, building types, development cost & financial analysis, indirect cost, fair cost (direct cost), estimating process, material takeoff, and bill of quantity.

2. Relate information through writing, diagram, illustration, or other materials or see its fullest implications.

3. Identify and solve problems individually or within a group.

4. Aware to perform professionally on the ethical issues involved in the formation of professional judgments in architectural practice.

ARC 498 Introduction to Real Estate **3 (3-0-6)**

Prerequisite: None

This course focuses on basic understanding of Thailand Real Estate Market and Embarking on Property Development. Not only is the necessary fundamental knowledge provided, but the class also aims to broaden student's perspective of career opportunity aside from architecture and design profession. The learning method includes lectures, group discussion and independent study with a field trip and workshop.

Learning Outcomes

1. Summarize of Thai Real Estate market as well as the role of real estate developer.

2. Summarize and identify the basic tools and procedures for property development.

ARC 499 Hospitality Design and Hotel Operation Management **3 (2-2-6)**

Prerequisite: None

Hospitality Design and Hotel Operation Management, this class will teach you how to start a successful hotel business focused on Boutique Hotel and Hostel. Not only architectural and interior design aspects are studied, but hotel operations are included. Moreover, learners will better know the chains-hotel criteria, hotel related law and Regulation and understanding hotel departments for example front office, reservation, housekeeping, and food and beverage (F&B).

Learning Outcome

Summarize an integrative design approach and management for a small hotel business focusing on boutique hotel and hostel, chains-hotel criteria, hotel related law and regulations.

ARC 553 Independent Study I **3 (1-4-6)**

Prerequisite: none

The primary purpose of an independent study course is to provide students with the opportunity to explore a special study topic that is not available through regular course offered. The topic is of mutual interest to the faculty and the student.

Learning Outcome

Display personal drive and their desire to improve their knowledge, research skill, and attitude to achieve the goals and meet the class expectations.

ARC 554 Independent Study II **3 (1-4-6)**

Prerequisite: none

The primary purpose of an independent study course is to provide students with the opportunity to explore a special study topic that is not available through regular course offered. The topic is of mutual interest to the faculty and the student.

Learning Outcome

Display personal drive and their desire to improve their knowledge, research skill, and attitude to achieve the goals and meet the class expectations.

CMD 364 Web Design **3 (2-2-6)**

Prerequisite: none

This course introduces students to the web design and development lifecycle. The course focuses on theory, tools, techniques, and standard in the design phase including layout design, interface design, components of web e.g., typography, color, media, contents, etc. It also covers the standards and trend in modern web design such as responsive web design (RWD) and other modern concepts in web design. The practical exercises cover the usage of tools and techniques in designing a web including the implementation of design into a real web site using a current available instant web implementation tool.

Learning Outcomes

1. Summarize the website development process, methodologies, tools & techniques in the design phase including the up-to-date trend in web design.

2. Apply the knowledge to design a website.

CMD 365 Web Development for Designer **3 (1-4-6)**

Prerequisite: none

This course introduces students to development concepts, processes, standards, tools, and techniques that are used to create a modern web site. The course includes practical exercises on creating web pages using modern concepts, tools, and techniques.

Learning Outcomes

1. Summarize the foundation of web development, process, methodologies, tools & techniques for developing a website.

2. Apply the knowledge with their design knowledge to develop and implement a website.

INA 314 Aesthetics **3 (2-2-6)**

Prerequisite: none

An investigation into appreciation of design philosophy in form and other elements and the meaning of aesthetic values in relation to other

elements of architecture and interior architecture. Aesthetics in design is aiming to study different alternative ways of seeing and of perceiving the world. 'Critical reflection on design, art, culture and nature' will be examined to defy the meaning of aesthetic values - "aesthetics – the beauty of design concept + design process".

Learning Outcomes

1. Broaden the vision of creativity through media as well as personal direct experience

2. Summarize and identify various approach of different design direction

3. Explain, analyze and criticize the art of design

4. Practice thinking processes to integrating philosophy and meaning into the design

5. Strengthen the ability of creating phenomena through design elements

INA 327 Adaptive Heritage Reuse 3 (2-2-6)

Prerequisite: none

This course examines the history and theory of historic preservation, focusing on Thailand, but with reference to traditions and practices in other countries. The class is designed to examine the largely untold history preservation movement in this country, and explore how laws, public policies and culture attitudes. The class gives students a grounding in the history, to theory and practice of historic preservation, but is not an applied, technical course.

Course Outcomes

1. Describe and Understanding: Knowledge-Understanding heritage conservation provides economic, cultural, and social benefits to urban communities. The decision whether to reuse a building entails a complex set of considerations including location, heritage, architectural assets, and market trends.

2. Describe and Understanding: Generic Skill of collaboration skills, communication skills, critical thinking skills, study skills, higher order thinking skills – decision making (with the help of graphic organizer)

3. Summarize and Present: Expertise and Specific Skill related to the analysis of the existing situation of the built heritage. Ability to identify and interpret the physical, social, and economic characterization, and values and their relationship with the physical and functional structure of the context. Ability to investigate the historic development process of a city.

4. Apply: Architecture and Interior architectural design skill through various tools following interior architectural professional standard.

5. Presentation: Design C communication and personal verbal the design outcome using mediums and tools effectively.

DIP 158 Photography 3 (1-4-6)

Prerequisite: none

Principles of Photography. Processes of Photography. Tools and techniques exploration. Artistic and aesthetic self-expression through photography.

Learning Outcomes

1. Deliver photography work that communicates narratives and their concepts.

2. Implement aesthetic principles and technical principles relating to photography in their photography projects.

Free Electives Not less than 6 Credits