

# **REGULATIONS FOR THE DEGREE OF MASTER OF ARCHITECTURE (MArch)**

*These regulations and syllabuses will apply to candidates admitted in the 2011-12 academic year and thereafter.*

*(See also General Regulations)*

Any publication based on work approved for a higher degree should contain a reference to the effect that the work was submitted to the University of Hong Kong for the award of the degree.

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## **Admission requirements**

**Ar76** To be eligible for admission to the degree of Master of Architecture, a candidate shall

- (a) comply with the General Regulations;
  - (b) be a holder of the Bachelor of Arts in Architectural Studies of this University; or possess a degree, diploma or other qualification of equivalent standard and content from another university or comparable institution.
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## **Curriculum**

**Ar77** The curriculum shall extend over two academic years of full-time study. Candidates shall not be permitted to complete the curriculum in more than four academic years.

**Ar78** To complete the curriculum, a candidate shall

- (a) enroll for courses of a total 96 credits (the normal load per semester being 24 credits);
  - (b) satisfy the examiners in all assessment tasks; and
  - (c) a candidate may, subject to approval by the Head of Department, take other postgraduate course(s) in the Faculty of Architecture to fulfill the elective course requirements.
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## **Assessment**

**Ar79** Candidates shall be assessed for each of the courses which they have registered for, and assessment may be conducted in any one or any combination of the following manners: written examinations or tests, written assignments or exercises, continuous assessment of performance, laboratory work, field work, research or project reports, or any other manner as determined by the examiners.

**Ar80**

- (a) A candidate must pass in all core courses.
- (b) A candidate may enroll in no more than 3 elective courses in the following categories unless prior approval is granted by the Head of Department:
  - Category I: Architectural History and Theory
  - Category II: Architectural Management
  - Category III: Architectural Technologies
  - Category IV: Independent Studies

**Ar81** The following clauses apply to candidates of all years:

- (a) Candidates who have passed a core course in Architecture and Urban Design in any semester:
    - (i) but who fail on the first attempt in not more than one other core course in any semester may be permitted to present themselves for re-assessment in the same course before the commencement of the next academic year. Those who fail in the second attempt shall be permitted to proceed to the subsequent semester of the curriculum and to present themselves for re-assessment in the same course only once more in the following academic year;
    - (ii) but who fail in more than one other core course in any semester on first attempt shall not be permitted to proceed to the subsequent semester and shall be required to repeat all or part of that year's curriculum and to present themselves for re-assessment in the following academic year. If they fail again on second attempt, they may be permitted to present themselves for re-assessment only once more before the commencement of the following academic year.
  - (b) Candidates who have failed a core course in Architecture and Urban Design in any semester shall not be permitted to continue to the next semester and must repeat the course.
  - (c) Candidates who have failed in one or more elective course(s) in their first attempt may be required to enroll in the same or an alternate elective course(s) in the following year to make up the failed elective course(s). Candidates failing in elective course(s) will not normally be offered an opportunity for re-assessment without re-enrollment in the same or an alternate elective.
  - (d) Candidates who have failed in any course at the third attempt shall be recommended for discontinuation of studies under the provisions of General Regulations G12.
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### **Award of degree**

**Ar82** The degree of Master of Architecture may be awarded with Distinction at the discretion of the Board of Examiners.

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## **SYLLABUSES FOR THE DEGREE OF MASTER OF ARCHITECTURE (MArch)**

*These regulations and syllabuses will apply to candidates admitted in the 2011-12 academic year and thereafter.*

For the purpose of these syllabuses, the teaching of each course will be conducted within one semester.

### **FIRST YEAR: CORE COURSES**

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#### **ARCH4001 & ARCH4002 Architecture and urban design I and II (15 credits each)**

These courses are conducted as design studios that lead students through the process of problem based learning in architecture. Each studio focuses on important aspects of the architectural and urban design fields synthesizing architectural design, building technology, architectural history and theory, and professional practice through design and research exercises. Course assessment is based on the completeness of the design solutions, the clarity and quality of the visual materials and student presentations, the originality and creativity of the project.

Field trips may be required for the course.

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#### **ARCH4003 Professional practice I (3 credits)**

The course covers the areas of land building, planning and contract law. Land ownership; lease conditions; landlord and tenant covenants; easements; rights of way; torts; Hong Kong town planning ordinance and procedures; buildings ordinance, regulations and other related laws; codes of practice and submission of plans to various authorities are also dealt in detail. Other topics which come under the preview of this course and are discussed include : Buildings Department's practice notes for Authorized Persons; formation and discharge of contracts; enforcement; breach and remedies, arbitration; types of contract; standard private and public building contract forms; subcontracts; nominated subcontractors and suppliers and other professional practice issues.

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#### **ARCH4009 Construction communication (3 credits)**

The means and standards of how the architects communicate their ideas to other partners in building process are of paramount importance to our profession. Nowadays high class rendered images and sophisticated physical models - tools, which are extremely valuable in communicating with Clients and securing jobs are increasingly being outsourced to specialized companies, due to time constraints, need for maintaining consistent visual standards and general tendencies for specialization in the world economy. Behind this marketing package however, in every project stage, there is work of preparing technical drawings – plans, sections, details which cannot be outsourced, as it requires true skills of an architect - creativity and deep understanding of building design and technology.

This course will guide students through various aspects and means of communicating the technical side of design to various parties. From hand sketches, which are often the fastest means of solving design and technical issues to ways of precise geometrical rationalization of building forms to putting together logical, properly referenced project packages, the students will learn hands-on the every-day work of an architect.

During the term, there will be several design/communication exercises spanning 2 or 3 classes each and related to a real design process.

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## **SECOND YEAR: CORE COURSES**

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### **ARCH5001 & ARCH5002 Architecture and urban design III and IV (15 credits each)**

ARCH5001 is conducted as a design studio that leads students through the process of problem based learning in architecture. Each studio focuses on important aspects of the architectural and urban design fields synthesizing architectural design, building technology, architectural history and theory, and professional practice through design and research exercises. Course assessment is based on the completeness of the design solutions, the clarity and quality of the visual materials and student presentations, the originality and creativity of the project.

Pre-requisite : ARCH4001, ARCH4002

Field trips may be required for the course

ARCH5002 concludes the architectural curriculum by means of a thesis project. Candidates are required to conduct a self-directed design project under the supervision of a faculty member. In addition to demonstrating satisfactory ability in the technical aspects of architectural practice, the thesis should produce innovative work to extend and enrich knowledge in the broader field of architecture.

Pre-requisite : ARCH 5001, ARCH6127

Field trips may be required for the course

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### **ARCH5310 Design, assessment and certification of sustainable buildings (3 credits)**

Integrated principles and methods for assessing and certifying green buildings will be taught and discussed. The key elements and characteristics of green building certification methods commonly used in Hong Kong, mainland China, and overseas will be highlighted. The Hong Kong Building Environmental Assessment Method, the Green Building Design Label Of China, and the US Leadership in Energy & Environmental Design (LEED) methods will be elaborated. Details on the scope of the US LEED Green Associate Examination will be taught.

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### **ARCH6127 Research seminar (3 credits)**

This course teaches research methods in architecture and urban design with the aim of preparing students to undertake a design thesis. The expected course outcome is the completion of a thesis statement based upon a proposal for an independent research and design project. The proposal should state a clear position in relation to contemporary architecture. Course format includes lectures, discussions, as well as individual research and writing.

Pre-requisite: ARCH4001, ARCH4002

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### **ARCH5003 Professional practice II (3 credits)**

Beginning with the code of ethics and professional conduct, the course proceeds to focus on architects registration ordinance; architect/client/ consultant/contractor relationship; project management; tendering procedures; bills of quantities (specifications). Scheduling techniques; measurement conventions; organization and management and other professional practice issues of HKIA and ARB are also covered. Legal responsibilities, relevant statute and case law are included. Analysis of relevant cases in architectural practice is also discussed.

Pre-requisite: ARCH4003

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## FIRST AND SECOND YEAR: ELECTIVE COURSES

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There are four categories offered by MArch as well as other course(s) in the Faculty of Architecture, within each of which there are a number of courses available for selection by candidates in the Master's programme. These courses may be taken in either the First or Second Year:

- I: Architectural History and Theory;
- II: Architectural Management;
- III: Architectural Technologies;
- IV: Independent Studies

1. Candidates shall be guided in selecting these courses. It should be noted that not all courses in Categories I, II & III would be offered every year and that new course(s) may be introduced in any year.
2. Not more than three courses are to be chosen from any one of the four Categories offered by MArch or in the Faculty of Architecture.
3. The assessment of the course may take the form of a written, practical or oral test, or by continuous assessment or by any combination of these. If a candidate is required to repeat a course because of failure but that particular course is not offered in the following year, his choice of an alternative course must have the approval of the Head of Department and the relevant course teachers.
4. For the purpose of assessment, one course shall constitute a paper.
5. Choice of other courses offered in the Faculty of Architecture is subject to prior approval by the Head of Department in consultation with the respective Programme Directors. Priority will be given to students from the respective programmes. Please check the courses offered by these programmes at the time of enrolment and refer to the respective programme syllabuses for their course descriptions.

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<i>CATEGORY I: ARCHITECTURAL HISTORY AND THEORY</i>
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### **ARCH5103 Housing in urban development (3 credits)**

The course investigates the production of housing within the social, political and spatial conditions in urban development. Topics include social and economic determinants of housing location, standards and quality of design; impact on urban development; analysis of housing production including site and infrastructure, provisions; constraints and innovations in the housing industry; and case studies by field trip.

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### **ARCH5105 The design of Chinese cities (3 credits)**

The course looks into the basic physical organization and development of traditional, colonial and contemporary Chinese cities. It aims to introduce methods in understanding how built forms, particularly urban public spaces and city fabric, express certain aspirations of a culture, and how culture itself conditions their physical shape. It also addresses the issue of urban transformation: how cities took the shape they did? What and why have they changed from their past forms to the present shape?

Field trips form an integral part of the course.

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**ARCH5106 The modern movement and beyond (3 credits)**

The course is concerned with theoretical aspects of design activities in architecture. It attempts to trace the evolution of spatial concepts significant to the modern movement and beyond. The course consists of two parts: analytical and synthetic. The analytical part is to develop the candidates' skill for deeper understanding of the complexity of the built form. The synthetic part attempts to follow the vicissitudes of architectural design through the examination of the works of certain architects.

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**ARCH5107 Vernacular architecture of Asia (3 credits)**

Vernacular built-form is the most obvious and direct means of expression of a people and its culture. Through the examination of different indigenous building types in different parts of Asia, viz. China, Japan, Indonesia, Malaysia and Thailand, candidates are able to develop a broader sense of understanding of the relationship between architecture, climate and culture.

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**ARCH5108 Topics in architecture (3 credits)**

This course gives students the opportunity to further explore specific issues and topics in architectural design and urban theory.

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**ARCH5109 Topics in architectural theory (3 credits)**

This course gives students the opportunity to further explore specific issues and topics in architectural design and theory.

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**ARCH5110 Topics in urban studies (3 credits)**

This course gives students the opportunity to further explore specific issues and topics in urban design and planning.

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**ARCH5111 Contemporary urbanism (3 credits)**

This course integrates urban analysis research and architectural design methodologies to examine relationships between architecture and urbanism through the development of a working understanding of urban and architectural form in the context of the Contemporary City. The course examines the contemporary urban condition through readings of critical theories, analysis of developmental models, as well as empirical investigation of urban sites. In conjunction with physical, historical, social and economic research, alternative design strategies are explored to challenge existing presumptions and models of the contemporary urbanism.

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**ARCH5113 The international style (3 credits)**

This course examines the architectural, urban, and discursive involvement of major protagonists of the modern movement in the non-Western world, including Africa, Asia, Latin America, and the Middle East. Through specific projects ranging from Le Corbusier's plan for Algiers between 1931 and 1934 to Louis Kahn's National Assembly Building in Dhaka, Bangladesh, begun in 1962, students will explore a variety of theoretical issues related to the internationalization of architectural modernism and its cultural, political, and social impact. Major themes to be addressed include but are not limited

to the influence of early 20<sup>th</sup> century colonial planning upon modernism, the modern discourse on vernacular, the modern architect as social activist, regionalism vs. critical regionalism, and the relationship between modernism and particularly “national” expressions of architectural form.

Sites and issues will be paired with a selection of primary and secondary source reading material intended to expose students to specific methodological concerns in the history of modernism while providing them with new perspective on the evolution of these theoretical concepts over time.

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#### **ARCH5114    Architecture and memory (3 credits)**

This course introduces students to a broad and critical approach towards issues surrounding the conservation of our built environment and cultural landscapes. With an increased relevance of architectural conservation in cities today, it imperative for students and practitioners to come to terms with the arguments, philosophies and genealogies leading up to the formulations of codes and practices. Unlike most histories and theories of conservation, which have remained within disciplinary boundaries of architectural practice, material research, techniques, applications and policies, this course seeks out relevance and theoretical formations across disciplines. Readings for this course include foundational texts in the discourses of tradition, historiography, collective memory, myth-making, structuralism and narratology, alongside various manifestations of history and memory in the forms of monuments, museums, theme parks and others.

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#### **ARCH5115    Architectural Histories (3 credits)**

This reading seminar offers an introduction to the historiography of architectural history and its predominant methodologies. Over the course of the semester, and proceeding in a roughly chronological manner, we will examine some of the key texts in architectural history, their authors, and their respective foci upon fundamental questions of structure, style, materials, and the historical origins of architecture itself.

The course’s main objective is to teach students how to think critically about how different histories of architecture have been constructed over time in a variety of particular political, social, as well as cultural contexts. Through these texts, students will also learn about the architects, buildings, and ideas that comprise them. More generally, this course provides students with a variety of theoretical and analytical tools necessary to develop a critical and comparative perspective with respect to the reading and writing of architectural history and theory today.

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#### **ARCH5116    Art in Architecture    (3 credit)**

The course attempts to build a bridge between students' professional architectural training and a broader education in the relevant liberal arts areas: in the psychology and philosophies of art and the history of art as it relates to architecture. Topics include an overview of aesthetic theories, on how ideas gain physical shape: the historical background, recent systemic theories, interpretation, criticism and the issue of art and linguistics versus architecture: from Aristotle, Tolstoy, Kant, Hegel, Hume, Nietzsche, Freud, Jung to Arnheim, Dewey, Goodman, Langer, Derrida, Scruton and more. The course will also address the issues of the social and environmental responsibilities of architecture, as well as the sentiments towards architectural conservation as societies seek to preserve their artistic and cultural identities.

### **ARCH6111 ReBuilding utopia: visions of architecture in the post-war world (3 credits)**

This course examines the occurrences of the utopian tendency within the production of architecture in the aftermath of World War II – an event of global magnitude that triggered a series of political, social, economic and cultural consequences in its wake. The bipolar struggle that characterized most of the latter half of the 20<sup>th</sup> century implicated architecture in many ways and at many levels. Amidst postwar reconstruction in Europe and Japan, the continuation of war via the Cold War, widespread decolonization and the territorial divisions of the globe into First, Second and Third Worlds, the rise of America as the dominant superpower, and the internationalization of American popular culture, visions of the future were conceived. Within these post-war contexts and post-colonial realities, the promise of utopia was not simply proclaimed by the avant-gardes. Under the rubric of democracy and modernization, the United Nations, governments of nations, non-governmental organizations, academic institutions and multi-disciplinary groups, took on the task of vision building. At the same time, there emerged those who conceived of counter-utopias and dystopias as responses to the experiences of global homogenization and upheavals occurring at local and regional levels. How was architecture instrumental in forwarding the objectives of the visionaries? How did technologies, methodologies and mindsets find their way into architecture and their corresponding discourses? In what ways did the multiple trajectories of utopia and utopian building inform the history of the discipline as it is understood today? Class discussions are based on assigned readings and individual presentations. Readings are primarily architectural texts but also include definitive texts from other disciplines including cultural studies, geography, sociology, and philosophy that are important in framing pertinent issues or events.

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### **ARCH6112 Modern architecture and the visual realm (3 credits)**

The objective of this seminar is to investigate the relationship of modern architectural work and the visual realm. The development of architectural theory, publication and/or detailing which simultaneously accept and deny the perception on modern architecture as a retinal art form will be the subject of discussion and investigation. In-depth analysis conducted on selected modern buildings form the basis of argument for students to develop their own critical thinking towards architectural theory and building appreciations.

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### **ARCH6114 Paradigms and prototypes (3 credits)**

This one term graduate seminar module develops knowledge and skills related to the design of prototypical models of architecture and urbanism, by means of students' analysis and evaluation of recent, innovative, seminal design projects, and their related techniques, strategies, discourses, and effects. The aim of this seminar course is to provide a thorough background to the theoretical knowledge related to work pursued in contemporary avant-garde design studios emphasising computational design and fabrication techniques. The seminar creates an important opportunity for students to reflect upon and evaluate their own ongoing design objectives and interests, in relation to recent design projects, and their affiliated techniques, concepts and discourses.

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### **ARCH6118 Urban research seminar (3 credits)**

This course is a research seminar open to MArch and RPG students with a serious interest in self-directed investigation into contemporary spatial, political and economic issues in contemporary urban studies. The course combines independent research projects and iterative analytical exercises. A reading list in contemporary urban studies and supplemented by readings introduced through research topics forms the basis for in-class discussion. With a goal of establishing literacy in both contemporary research topics and methods, and developing a critical activism towards contemporary

urban conditions, a dual emphasis will be put on research and its representation with student presentations scheduled throughout the term.

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**ARCH6128 Protracting night (3 credits)**

This seminar explores both historical and contemporary issue of nocturnal phenomena, investigating night as a medium how cities develop and addressing its architectural forms, and as a site that generate our theoretical understanding of anomalies in politic and economy. The phenomenon of night invokes theoretical contemplation into perception and the senses. We will explores as architectural research and develop design methods inductively addressing a range of issues, from the domestic to the urban, from literary forms to the architectural text. Case studies examine contemporary art and architectural practices, writings that circumscribe night reflect on its limits and potentials. Students will develop a detailed research project, grapple with night as the artificial and natural agent that stimulates our sight, ultimately coming to understand our needs for light but also finding a place for darkness.

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**ARCH6129 Inter cities (3 credits)**

Inter Cities will explore transitional areas that are about to undergo significant urban transformation either in terms of massive growth or shrinkage. Usually occupying peripheral territories on the edge of cities these areas display unique characteristics – they are anomalies, estranged and contradictory to normative planning methods. Their condition is patchy and often incoherent mixing landscapes, industrial wastelands, and pockets of residential enclaves. Their governance and control is often contested involving overlapping political and individual desires. Examples include the Frontier Closed Area of the Hong Kong and Shenzhen border as well as the Thames Gateway in East London. As they are emergent they display conditions of urbanism that are un-tested and somehow prototypical providing clues to how the future of our cities may evolve. To this extent Inter Cities are at the forefront of contemporary urbanism. The course will examine the conflicting forces that shape these unique urban landscapes including economy, politics, globalisation, industry, environmental conditions and shifting cultural values. Graphic techniques of mapping, diagramming and composite drawings will be key tools of investigation. Future speculations will be drawn as visual provocations for these unique urban landscapes.

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**ARCH6219 Globalization and Resistance in Architecture (3 credits)**

This course aims to examine how the condition of globalization reveals itself in architecture and the urban environment. With an improved understanding of the various forces at play, students are encouraged to think of ways to support a citizenry participation and critique in the making of our buildings and cities in the era of globalization. Paul Ricoeur described a condition of “universal civilization” that encapsulates a scientific spirit and a consumer culture. Today, we are perhaps operating universally under the effects of globalization, aided in no small part by the advent of the information age as well as a more liberal flow of capital and labor. This course will seek architecture as a barometer that measures these effects – appraising specifically the qualities and identities of buildings and districts built or transformed as a result of globalization. Through ten specific readings and building types, the course will examine the co-operative and resistant practices and forms at play.

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**ARCH6220 Research Seminar in Visual Cultures (3 credits)**

This course is a visual research seminar with a serious interest in self-directed investigation into urgent spatial, social, cultural, political and economic issues in the world of visual culture today. The aim of this seminar course is to provide a theoretical knowledge, independent visual research issues of

cultural difference, performativity, visual display, aurality, encounters with audiences and the production of subjectivities. The seminar with collaborate art institution develop activism towards issues of visual cultures, emphasis will be put on visual research and its production.

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**ARCH6221 Topics in Modernism (3 credits)**

This seminar investigates the multitude of theories and practices made manifest in architectural and urban form over the course of the late 19<sup>th</sup> and 20<sup>th</sup> centuries. Building upon the fundamental question of what constitutes modernity, modernization, and modernism, we will situate architecture, urbanism, and the architect within a series of broader epistemologies and theoretical concepts, including the diaspora, cross-cultural interaction, globalization, memory, nationalism, Orientalism, the nature of dissent, regionalism, technology, and the problem of translation. Through intensive reading, in-class discussion, and students' individual research projects, the course will also provide a forum for students to discuss these issues with each other and explore new lines of critical inquiry as they pertain to the nature of design research.

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*CATEGORY II: ARCHITECTURAL MANAGEMENT*

**ARCH5201 Aspects of contract management (3 credits)**

Detail analysis and studies of standard contracts and sub-contracts for public and private works in Hong Kong. Practical problems in contract administration and project management, the cooperation and partnering of the architect, project manager and the contractor will be examined. Claims, counter-claims, mediation and arbitration will be considered.

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**ARCH5204 Principles and practices of building codes (3 credits)**

The course covers the area of Building Control in detail. The principles, practices and applications of the Building Codes, including the Buildings Ordinance, Building Regulations, Codes of Practices, and Practice Notes for Authorized Persons, will be extensively discussed and explained. Lectures will be supplemented with case studies involving projects in local architectural practices.

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**ARCH5311 Digital Media and Methods (3 Credits)**

This course provides a comprehensive introduction for Masters students to three-dimensional digital media and methods for architects. The focus of the course is on the application of relevant software packages towards design, analysis, fabrication, and documentation, emphasising topics as the controlled modeling of complex form and the rationalization non-planar geometries. The goal of the class is to bring Masters students with basic skills in the use of software for architects quickly up to speed with essential tools and processes. Students who did not graduate from the BA(AS) program at HKU and do not have a background in digital media and methods are highly encouraged to enroll in this course in their first semester in the MArch program.

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**ARCH6130 Building information modeling in architectural practice (3 credits)**

BIM technology is more and more often adopted in architectural practices throughout the world as the main tool for design, managing and documenting projects. Successful implementation of BIM for day to day work in an office and taking most advantage of the technology requires proper configurations, methodologies and standards. Without such structured approach and without applying best practices

developed by the industry, BIM may easily become more of a problem than a solution. BIM technology allows integration within one project database of Architecture, Structure, MEP (Mechanical, Electrical, Plumbing) and others to create a complete virtual model of a future building. Such a model is like a living entity, constantly updated throughout the design process and later during the building lifetime. In various stages of this lifetime a BIM model can be used for many purposes from scheduling and calculating areas, curtain wall costing, outputting documentation, performing thermal analysis to managing tenants and security issues in the field of building maintenance. Achieving those goals requires understanding of capabilities and limitations of the technology in very practical aspects, but also orientation in prospects and future opportunities for BIM

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### **ARCH6131 Introduction to building information modeling and management (3 credits)**

BIM technology is changing and will continue to change the face of architectural profession. It influences all stages of design and project management and aims to integrate within one database Architecture, Structural Design, MEP (Mechanical, Electrical, Plumbing) and others. This database, which contains a 3D model of a building, formal project documentation and other information is a dynamic object, constantly updated throughout the whole design process and building lifetime. In any stage of the project it may be a source of invaluable, up-to-date information about building parameters and physical performance, which would be difficult or expensive to obtain using traditional methods. Such data can help the architect to make more informed decisions at earlier stages of design, which greatly reduces costly changes and errors. The objective of this course is to familiarize students with basic ideas and applications of BIM technology using the most widely adopted BIM software package, Revit Architecture. Examples used for this purpose during the course will be based on real projects and case studies, which count themselves among the most complex and innovative in terms of design, modeling approach and project management.

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### **ARCH6134 Explorative architecture practice (3 credits)**

As advanced digital and information-based design methods and production techniques are applied increasingly in contemporary architectural design, it is essential for architects operating in this Information Age to gain an understanding of its explorative design methods. With case studies of today's leading architectural practices as a starting point, this course investigates how evolutions in digital design trigger a paradigm shift in the production of architectural form, material application and project management. Research on manufacturing and construction technology is combined with analysis from initial geometry build-ups to project delivery, aiming to gain an understanding of the coherent building systems used in the creation of explorative architecture.

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### **ARCH6135 Explorative architecture techniques (3 credits)**

The profound embedding of advanced digital and information-based tools in all aspects of explorative architectural practices has caused a radical revolution in contemporary design techniques. By combining case studies of today's leading architects with tutorials on advanced 3D modeling, parametric and algorithmic design methods (scripting), this course investigates the use of digital design techniques in the translation of geometries into built form. The aim is to gain an understanding of the geometric challenges, material possibilities and limitations faced with when working within this new paradigm.

<i>CATEGORY III: ARCHITECTURAL TECHNOLOGIES</i>
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**ARCH4005 Building structures and systems (3 credits)**

The course is designed to close the gap between structural theory and design. The subject is divided into two parts. The first part highlights the more important aspects of the structural planning process from architects' point of view. The second, analytical part, develops candidates' skills through case studies of actual projects leading to a deeper understanding of the complexities of the structural problem. Topics such as building failures, structural alteration and additions, building regulations, geotechnics, foundations on difficult grounds and computer-aided structural design/analysis will be discussed.

The course provides an understanding of the realities of designing and manufacturing components of buildings within aesthetic, economic and time frameworks. Design construction communication is studied through production and technical drawings, manufacturer's shop drawings with special emphasis on the use of materials and manufacturing technology. Direct studies of manufacturing techniques both traditional and new are undertaken by field trips to factories and construction sites. Construction systems including the systems approach, standardized buildings, contractual strategies and their impact on the evolution of building production are investigated.

Field trips to construction sites and design offices form an integral part of the course.

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**ARCH5302 Computer graphics for architects (3 credits)**

Through a series of exercises, presentations, and discussions, the course will investigate the evolving relationship between architecture and its means of representation, as well as broader issues of technology, information, and culture. While the course will explore the impact of computing technology on the representation of architecture, it will also provide a firm understanding of some of the software required to do so.

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**ARCH5303 Sustainable building systems (3 credits)**

Advanced studies in innovative technologies are undertaken. Energy efficient and intelligent buildings are analyzed and advances in parallel industries such as aerospace, shipbuilding and the transportation industries are studied for applicability in the building industry. Computer modelling is used extensively in this option. Total energy systems are investigated as are low environmental impact techniques.

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**ARCH5304 The computer in architecture (3 credits)**

An introduction to computer-related tools and techniques useful to architects in professional practice. It includes the use of computers for office automation and management as well as various design and analysis applications in architecture and related fields.

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**ARCH5305 Computer-aided architectural design methods (CAAD Methods) (3 credits)**

A study of current computer techniques and technologies which can be used by architects to develop design methods that fully exploit contemporary computers as design aids.

### **ARCH5308 Topics in advanced technology (3 credits)**

This course gives students the opportunity to further explore specific issues and topics in computer and advanced technology.

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### **ARCH5309 Design research on architectural sustainability (3 credits)**

This course focuses on new and more precise understandings of the way in which architects design and work with principles of sustainability. It foregrounds design research and looks at the “architectural” use of various energy-related building technologies. Students will be introduced to critical and noteworthy texts underpinning the more general relationships between architectural design and technology. Case studies, model making and prototypical modes of research will be used as a vehicle to discern specific disciplinary design techniques and strategies.

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### **ARCH5312 Materials, Services and Structure (3 credits)**

This course concentrates on understanding and applying the principles of building structures, building materials and construction technology, environmental controls and building services, in an advanced level of integrated architectural design, geared to the local context. For building materials and construction technology, the emphasis is on the performance criteria and applications of building materials, components and systems of construction. For building structures, the emphasis is on structural schemes systems relating to local building regulations and codes. For environmental controls and building services, the emphasis is on local regulations and codes, and coordination of services for heating, ventilation, air-conditioning, fire safety, plumbing and drainage, electrical, lift and escalators, etc.

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### **ARCH5313 Nonspace: Materials, Processes, and Constructions (3 credits)**

While space is the most distinguished objective of architecture, the boundaries and character of space are defined by elements of non-space: materials, processes, and constructions. This is the paradox of architecture. This course explores a conceptual framework for the environmentally responsive design of building assemblies, based upon a clear understanding of materials and their inherent processes and construction technologies. Building materials will be analyzed and carefully drawn with emphasis on their physical and architectural properties, functions, and behavior in manufactured and installed constructions. The design of building assemblies made from concrete, masonry, timber, steel, and glass will be examined in relation to the forces that shape their composition and performance.

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### **ARCH5314 Parametric Structures (3 credits)**

This research seminar will examine the concept of parametric systems and their applications in and implication on architecture. Through a series of lectures and guided design exercises students will be introduced to the theoretical background and logic of parametric systems and the generation of them in the digital environment. Historical building precedents of specific architectural typologies will be examined to open up a critical dialogue between existing physical constraints and the digital realm. Different design techniques will be studied and deployed in order to generate several parametrically driven prototypes that have the capacity to form innovative architectural structures.

### **ARCH5315 Creative Computation (3 Credits)**

Based on advanced applications of programming in architectural design, this course offers students opportunities to learn code-based design skills (e.g. Rhino Scripting) and associated knowledge. The objective of the course is to fuse the intuition of the human brain and the computational power of the computer processor towards more meaningful creativity within the field of architectural design. Students will synthesize computation with functional, aesthetic and other architectural constraints in respect to individual sense and intuitive preference.

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### **ARCH5316 Design Research on Architecture and the Environment (3 Credits)**

This course focuses on case studies and design experiments related to architecture and the environment. It foregrounds an understanding of the effects of architecture on its immediate environment, literally the environments that buildings create. This course will be conducted as a research seminar, the predominate mode of thinking, intellectual development and idea formation for the course is physical modeling and diagramming. Each week students will be required to do a series of readings and will work in teams to analyze two precedents through sectional models, drawings and diagrams. Students will study two precedents over the course of the entire semester devoting approximately a half a semester to each. Students will be asked to cull out specific design ideas from readings and associate them with sectional models and drawings for in class discussions and pin ups. Case studies, model making and prototypical modes of research will be used as a vehicle to discern specific disciplinary design techniques and strategies.

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### **ARCH5317 Making Ways and Ways of Making (3 credits)**

One to one design is not an issue of how large a physical output becomes but rather how the properties of real materials are vigorously experimented with at any particular scale. The seminar will strive to bring forward inventive means of making that engage material behaviours in response to external forces at work while remaining receptive to its investigated scale. Making ways for such prototypes will address the necessity to construct intermediary frameworks which will become an integral part of the making process. This workshop based seminar, supported by a series of lectures, will encourage students to explore procedural logics of making that expand on and revisit initial design premises from a series of physical explorations at incrementing scales. Each scale of investigation will have its own design focus and will inform the overall conception of a collective design-built project realized by the students near the end of the course. The core ideology is to influence the process of architectural design in reverse; that is by synthesizing an architectural proposal from the findings emerging out of a succession of well crafted experiments.

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### **ARCH6115 Topological structures (3 credits)**

This intensive workshop focuses on two main objectives. The first one concentrates on a practical investigation on topological surfaces and their spatial properties to expand the language of architecture. The second one addresses the issue of parts to whole and the question of constructability. Where in the first part students will learn how to draw and construct intricate surfaces digitally using software packages like Maya and Rhino, the second part focuses on the parametric discretization of these morphologies and later how to digitally manufacture them.

### **ARCH6123 Topics in architectural technologies (3 credits)**

*This course gives students the opportunity to further explore specific issues and topics in architectural technologies.*

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### **ARCH6126 Building technology & prospects (3 credits)**

The intention of this course is three-fold. First, for students to learn about existing building technology beyond conventional building systems such as mechanical, electrical, plumbing, fire services, etc., and how such technological advancement has been changing the design and construction industry, the environment, as well as users' experience. Second, to inspire and encourage students to develop a vision of the future of technology, its application to / integration with architecture, and its interface with users and environment. Third, for students to explore how technology is going to bring innovation to sustainability design, and how individuals or companies can use building technology to make a positive impact to architecture and the environment.

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### **ARCH6136 Innovative façade design (3 credits)**

This course explores in depth the technical knowledge necessary to design, detail, specify and construct the building enclosure. The course emphasizes current and emerging technologies of the curtain wall. Case studies of historical as well as contemporary examples are used throughout to illustrate the technical content of the course.

While discussion of specific technical issues and methodologies focuses on those aspects that directly inform architectural design, it is the intent of this course to provide graduating students with a comprehensive understanding of the technical concepts as well as the specific technical skills necessary to undertake the actual detailing and specification of a curtain wall. Deliverables include the design and detailing of a curtain wall of the student's own design.

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### **ARCH6414 Architecture by Nature (3 credits)**

Architecture by nature evolves autonomously from its users and engages with the dynamic complicity between built projects and processes in nature. It is less concerned with environmental compliance and more with the productive collision between architecture and nature: landward, seaward and skyward. We will study intentions from ideal and elementary architectural precedents throughout history. These case studies are grafted in and wrought by extreme environments and will offer a platform from which students will develop their own project. Time based procedures will be introduced as a mean to register physical transformations in the natural environment. We will seek to create specific architectural prototypes that without dependence on nature would simply become generic; instruments taking on the active and physical role of measuring spatially the changing nature of environmental force, otherwise intangible. The essential question for the seminar is: "How does the architect project adaptively and in complicity with such evolving physical and spatial environments?"

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<i>CATEGORY IV: INDEPENDENT STUDIES</i>
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### **ARCH5404 Practicum (3 credits)**

This course provides candidates in the Exchange Programme opportunities in understanding the architectural professional practices in Hong Kong. Candidates are expected to undertake the practical training for a period of no less than two consecutive months under the supervision of the Exchange Programme Director. A log-book is required at the end of the Practicum.

**ARCH5405 Independent studies (3 credits)**

The objective of this course is to allow candidates to pursue independent studies to strengthen critical analytical skills and reflexive learning. With the permission of the supervisor, students may choose reading materials that focus on the exploration, analysis and/or revelations on concepts in architecture and urbanism.

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**ARCH5406 Community Building Workshop (3 credits)**

The course intends to investigate issues in design and construction through hand-on experiences and involvements in an actual building process. By participating in the design and construction of various types of community projects including temporary or permanent installations, shelters or buildings, students are to explore the nature of materials and structure, methods in construction, as well as modes of fabrication and design media. The process also provides opportunities for students to interact and exchange knowledge with different stakeholders involving in the building process: users, contractors, managers and sponsors. The focus of task for each year may vary pending on the nature of project and resources available, but a commitment to the community and a team work spirit, as well as the appreciation of the tactile and tectonic quality in design will always be essential part for the course.

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