

General Guidelines on Pre-Defined Learning Outcomes for Architecture Students Interning in Consultancy Built Environment Firms

1. UNDERSTAND INDUSTRY DOCUMENTATION/ DRAWING STANDARD

- Understand common architectural drawing softwares and formats adopted by the industry
- Understand the functions of common BIM/CAD softwares (such as Xref, block tools, layer system and etc.)
- Interpret the scale, dimension, text and annotation in architectural drawings
- If other, please specify*
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2. COMMUNICATION SKILLS FOR WORK

- Learn formal report writing
- Learn business email writing
- Make oral presentation to seniors / management / clients
- If others, please specify*
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3. EXPOSURE TO CONCEPT DESIGN

- Introduction to project brief and related concept design information
- Introduction to client and user needs
- Process of generating ideas and inspiration to build design scheme
- Support preparation of design presentation drawings including 3D rendering, coloured plan and elevation plan
- Support building of 3D models (e.g. using 3D printers) to demonstrate the design concept
- If other, please specify*
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4. EXPERIENCING DESIGN DEVELOPMENT PROCESS

❖ Overall Design and Planning Stage

- Involvement in space planning (adjacencies, circulation and articulation and shaping of space)
 - Learn to rapidly visualize concepts through sketching
 - Learn how to justify design solutions relative to the goal and objective of the design concept
 - Support the review and analysis of material properties and characteristics before choosing, include liaising with product /material suppliers to get more information
 - Understand GFA regulations and carry out GFA calculations using suitable digital tools to assess if user requirements are met
 - Exposure to different government regulations (e.g. building codes, fire safety codes, GreenMark score etc) that have an impact on building designs
 - Exposure to URA planning submission and BCA building plan submission requirements and procedure
 - Attend design review and discussion with project lead/manager
 - Participate in the project's meeting to observe inter-disciplinary problem solving process
 - Minute key points of meeting discussion
 - If other, please specify*
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❖ Building Information Modelling (BIM)/ Computer-Aided Design (CAD)

- Draft 2D drawings
 - Produce Building Information Model (BIM)
 - Perform BIM visualization
 - If other, please specify*
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❖ Integrated Digital Delivery(IDD)

- Understand the concept and objectives of IDD
 - Understand the scope of IDD in digital design/digital manufacturing and fabrication/digital construction/digital asset delivery and management
 - Understand the roles and responsibilities of architects in IDD
 - Understand the roles and responsibilities of team members from other disciplines in IDD
 - Carry out / support collaborative and coordinated design via BIM/Virtual Design & Construction (VDC) and other computation tools. Understand how digital design tools help to optimise downstream process (manufacturing, fabrication, construction and maintenance)
 - If other, please specify*
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❖ Design for Manufacturing and Assembly (DfMA)

- Understand the concept and objectives of DfMA
 - Understand the DfMA continuum and different DfMA construction technologies from prefabricated components to fully-integrated assemblies such as (Prefabricated Prefinished Volumetric Construction (PPVC))
 - Application of DfMA construction technologies to different types of developments
 - Understand design considerations and limitations for different DfMA technologies
 - Identify the suitable type of DfMA modules to be considered and the choice of material (e.g. reinforced concrete PPVC module or Steel PPVC Module)
 - Assist in development of design options for the modules and estimate the size and number of modules
 - Explore different design layout and module configuration to meet design objectives and user requirements
 - Understand project management consideration in site planning (e.g. staging areas for hoisting machinery and modules) and construction sequencing
 - If other, please specify*
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❖ Green Building Designs

- Understand Green Mark schemes and regulations for different types of buildings
- Application of passive design strategies to building designs
 - Assist in development of different building orientation and massing options
 - Exposure to different types of green building façade and their design considerations
 - Understand design considerations for naturally ventilated buildings
- Application of active design strategies to building designs

- Assist in building performance simulations using suitable softwares (e.g. solar modelling, daylight modelling)
 - Assist in development of building designs to optimise daylight penetration
 - Exposure to sustainable lighting design and technologies
 - Assist in development of greenery designs
 - If other, please specify*
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5. CONTRACT DOCUMENTATION

- Prepare drawings, schedules and specifications as an integrated system of contract documents which is appropriate to project size and scope, including design solutions and related interior construction details.
 - Prepare contract drawings include layout plans, electrical plans, lighting/reflected ceiling plans, elevations, sections and details.
 - Produce schedules including interior building specifications, furniture specifications, finishes schedule, sanitary schedules and door schedules.
 - Learn about contractual and administration procedure in issuing drawings/document such as drawing transmittal and distribution.
 - If other, please specify*
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6. CONSTRUCTION STAGE

❖ Construction and Measurement

- Understand and observe the actual site condition
 - Learn how to develop alternative design solutions to resolve construction error or unexpected site constraints
 - Learn how to control and distribute incoming and outgoing drawings/documents
 - If other, please specify*
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❖ Overview of Safety, Health & Environment Management

- Learn about Workplace Safety and Health (WSH) Management System
 - Understand the Workplace Risk Assessment (RA)
 - If other, please specify*
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❖ Project Management

- Understand the role and responsibilities of different personnel (e.g. site supervisor, Resident Technical Officer, Resident Engineer, project manager from contractor firm etc) in the project team
- Understand the contract procurement method used in the project
- Assist project manager in coordinating / executing design and contract related matter

- If other, please specify*
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6. FACILITY MANAGEMENT RELATED

❖ Design for Maintainability

- Understand the basic principles of design for maintainability in design
 - Plan for downstream maintenance
 - Acquire knowledge on the different material and system types to reduce downstream maintenance
 - Account for early access for maintenance
 - Design for simple maintenance
 - Basic understanding on the different material properties especially properties related to durability and maintainability
 - Able to recommend selection of materials to minimize maintenance issue
 - Carry out Life cycle costing justify the case for maintainable designs
 - If other, please specify*
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❖ Smart FM

- Understand the basic principles of Smart FM
 - Understand basic concepts of IoT, Sensor/Transducer for air/fluid temperature
 - Basic understanding on a smart building network (i.e. ACMV, Fire Protection, Plumbing, Lift and Escalators, Surveillance etc.)
 - If other, please specify*
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❖ Digital Asset Delivery

- Understand the concepts of Digital Asset Delivery and benefits in integrating BIM data
 - Basic understanding of BIM modelling concepts
 - Understand the Asset Information Model (AIM) specified and prepare the necessary information based on the requirements
 - If other, please specify*
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