Singapore Institute of Management

MODULE OUTLINES

BUSM2737 Energy Moisture and Airflow in Buildings

An advanced understanding of building physics is required to successfully deliver energy efficient and sustainable buildings. Professionals in the areas of design, engineering and project management all require knowledge of methods for measuring and verifying the sustainability performance of buildings and of the physical processes that determine performance, namely the flows of energy, moisture and air in the built environment.

This module will develop the specialised knowledge and skills required to analyse and apply the scientific and engineering principles of heat and mass transfer in the Built Environment. Students will acquire the skills and knowledge required to perform calculations of air, moisture and energy flows in buildings, and apply these skills to develop building design strategies and to undertake energy audits.

BUSM2739 Building Sustainability Assessment

Building sustainability assessment tools are essential in sustainable building design, construction and retrofit projects. With so many tools available, their selection and use has become an important consideration for building practitioners as these assessment tools can affect the direction of a project and whether a project succeeds in meeting its goals.

In this module students will develop and apply expert judgement in the selection, implementation and development of sustainability assessment tools that meet project needs. The module will consider building sustainability assessment tools through a critical lens, by developing students' knowledge of fundamental sustainability concepts, then applying this knowledge to evaluate the tools themselves. In doing so, students will be exposed to a wide range of assessment tools currently being used in the building industry and will be able to analyse the strengths and weaknesses of each. During the module students will perform sustainability assessments, using selected tools, such as Green Star rating tools.

BUSM2740 Sustainable Facades and Materials

The fabric of a building, including its façade, plays a critical role in determining its sustainability performance. Professionals working on sustainable building projects need to understand the environmental impact associated with building materials. They also need to know how façade systems 'work' in a theoretical sense and perform in real world settings, and how to evaluate the performance of these increasingly complex systems.

Students will develop and apply specialised knowledge and skills required to evaluate the sustainability performance of building materials and complex building

façade systems. They will acquire the skills and knowledge required to design and specify materials and system for building façades, and to communicate the advantages, disadvantages and feasibility of different systems and solutions to a diverse range of sustainability stakeholders, including building designers and owners.

BUSM2742 Sustainable Building Design Project

The module is primarily delivered as a practical studio whereby students develop and apply a sustainable project design and energy efficient rationale to produce a design for a sustainable project. They will integrate and apply the knowledge and skills developed through their learning so far in this program.

Students will develop their ability to develop project design strategies and solutions and gain advanced knowledge of integrated design processes, from initial design concept stage to project completion, and products and materials used in sustainable projects. They will work in teams that simulate integrated design practice in industry including the architectural, engineering, construction and management disciplines. Students will use collaborative software tools and platforms to interact on-line and develop design proposals.

This module equips students with the requisite skills and knowledge to undertake leadership and team roles in sustainable projects, integrating people, design processes and state-of-the-art online information and communication technologies as used in commercial projects.

BUSM2738 Building Modelling and Simulation

The application of modelling and computer simulation tools plays an integral role in the design and evaluation of energy efficient and sustainable buildings. Design, engineering and project management professionals use building simulation to understand and assess building performance. The results of modelling and simulation are required at multiple stages of the design process and need to be evaluated, critiqued and communicated to multiple stakeholders, including clients, architects, engineers and regulatory bodies.

Students will develop the specialised skills and knowledge required to carry out complex simulation and modelling tasks, developing professional capabilities in multiple modelling platforms including thermal, air flow and lighting simulation. They will gain expert knowledge in this emerging field, allowing them to understand the limitations and accuracy of building simulation. Students will further develop skills for communicating the outcomes of building simulation to diverse stakeholders and to facilitate their use in the delivery of successful design strategies and implementations.

BUSM2743 Managing Sustainable Building Projects

This module is designed to enable students to further develop their understanding of energy efficient and sustainable building projects in the wider context of sustainable development. They will apply contemporary sustainable design theory and high-level investigative tools and methods to investigate a real or simulated project-based problem.

Students will apply their developed skills and knowledge to enable the successful planning, development and implementation of building projects that satisfy environmental and socio-economic sustainability requirements. In doing so, students will undertake a case study project to apply their understanding of the key factors that drive success or failure in sustainable building projects.

Through their independent work and collaboration as a member of a project team, students also apply and refine their advanced knowledge of the processes and software tools for managing the strategic direction of these projects. This comprises the key stages of project management from project initiation through to completion, including the use of integrated design, building information modelling and/or collaboration tools, which include the management of goals, scope, sustainability objectives and performance, cost, construction processes and risk.

BUIL1331 Sustainable Building Investigation

This module will develop students' capacity to synthesize, integrate and apply the specialised knowledge and skills they have developed so far in this program. In doing so students will apply sustainable building concepts and research tools and methods to investigate a real or simulated sustainable building project-based problem. In response to a sustainable building project-based problem students will identify, gather and utilise published data and information to respond to a client problem, industry need or project organisation scenario. Students will also be required to independently source and analyse peer reviewed literature. Their investigation may be based on a topic relating to their current or past professional context, or to an industry issue students identify to investigate.

Their research investigation will be supervised by a lecturer who specialises in their topic area. The academic supervisor will advise on academic issues associated with the students' project selection, project design and report preparation, as well as related industry engagement. Their investigation will also be supported through their engagement in interactive workshops in which students will critically examine a range of sustainable building issues, current industry trends and current and emerging developments in the sustainable building field. Students will critically examine and apply investigative design methods and data analysis techniques.

This module includes a work integrated learning experience in which their knowledge and skills will be applied and assessed in a real or simulated workplace context and where feedback from industry and/ or community is integral to their experience.

BUIL1330 Sustainability in the Built Environment: A focus on building and design
The building industry is under increasing pressure to improve the sustainability performance of buildings. This presents a significant innovation challenge for building designers, developers and managers.

In this module students will develop their understanding of the context, principles and practice of environmentally sustainable design (ESD), with an emphasis on the energy and environmental performance of buildings. Students will further develop their understanding of the strategies used in environmentally sustainable design and the performance assessment frameworks used to determine the sustainability of the built environment.