

EXECUTIVE EDUCATION

2012 INTAKE

**A POSTGRADUATE
PROGRAMME FOR
GREEN PROFESSIONALS
IN SINGAPORE**

Master of Science in
**SUSTAINABLE
BUILDING DESIGN**



The University of
Nottingham

BCA ACADEMY
of the built environment

PROGRAMME COLLABORATORS

Sustainable building and technology is a major new and exciting growth area for the building and construction industry. This 2-year part-time MSc programme, jointly organised by the University of Nottingham, UK and the BCA Academy, Singapore, is specially crafted to build up a talent pool of green building professionals with expertise and capabilities in the area of green building design, a key component of sustainable development.

“ This bespoke Programme focuses on sustainable building design in a more holistic manner. The programme encourages creative approaches to developing green building design solutions and places particular emphasis on the Singapore context and climatic conditions. The course will be delivered by academics that actively engage in industry-focused research, thereby enriching the learning experience and maintaining the industrial and practice relevance of the Programme. Significantly, the course also fosters an interdisciplinary approach to sustainability within the built environment and will involve students from varied professional backgrounds engaging and working together to reflect contemporary practice. ”

Professor Timothy Heath, Associate Dean for Internationalisation and External Relations, Chair in Architecture & Urban Design, Faculty of Engineering

DISTINGUISHED FEATURES

The Master of Science in Sustainable Building Design is a multidisciplinary postgraduate study programme tailored to the specific needs of 'green' built environment professionals in the region.

The curriculum emphasizes the importance of adopting an integrated approach to sustainable building design and its associated technologies, therefore addressing the needs of the profession at large. This includes passive / bioclimatic design, urban design, renewable energy technologies and solutions, energy efficient services and systems, computer modelling and simulation, and total building performance solutions.

Participants successfully completing the programme will acquire a broad range of competencies ranging from undertaking macro, meso and micro analysis of buildings, to applying advanced simulation techniques to the design process.

KEY EMPHASIS

- An inter-disciplinary approach
- Integrated design
- Advanced building systems & technology

DELIVERY

This two-year part-time study programme is taught by academic staff from the University of Nottingham, UK, and is supported by local professionals, where applicable. All modules are delivered face-to-face through intensive four-day teaching blocks at the BCA Academy campus in Singapore. Additional tutorial support is provided through dedicated video-conferencing sessions and a vibrant online learning portal hosted by the University of Nottingham.

The first rule of sustainability is to align with natural forces, or at least not try to defy them.

- Paul Hawken



PROGRAMME STRUCTURE

No	Module Title	No. of Credits
1	Principles of Environmental Design	15
2	Environmental Design Strategies	15
3	Tall Buildings, Urban Design, Climate and the Environment	15
4	Architecture, Climate and the Environment	30
5	Energy Efficient Technologies	15
6	Renewable Energy Design	15
7	Energy Efficient Design	15
8	Dissertation	60

Each 15-credit module is delivered as a single intensive teaching block which comprises:

- i) 20 hours of lecture on:
 - a) Wednesday and Thursday, 6pm to 9pm
 - b) Friday and Saturday, 9am to 5pm
- ii) 2 hours of tutorial via video conference

The 30-credit design module is delivered in two intensive teaching blocks which comprises:

- i) 24 hours of lecture on:
 - a) Wednesday and Thursday, 6pm to 9.30pm
 - b) Friday and Saturday, 9am to 6.30pm
- ii) 2 hours of tutorial via video conference

In addition to the above intensive study periods, participants are expected to undertake pre-and-post module self-study on top of the module assignments.

Lectures for 2012 intake will start on 5 Sep 2012 and face-to-face lectures are normally conducted in the months of Sep, Jan, Apr, Jun and Jul.



DESCRIPTION OF MODULES

PRINCIPLES OF ENVIRONMENTAL DESIGN (15 credits)

This module introduces several key principles and theories associated with architectural science as it applies to the design of buildings. By providing students with knowledge and understanding of the physical foundations of design, it introduces the methods, techniques and tools available for enhancing both the environmental performance of buildings and the comfort of occupants. Focusing on the key concepts associated with the passive environmental design of buildings, it seeks to foster an integrated approach to the main passive design drivers such as climate, orientation, morphology, materials use, natural lighting and heat flows within buildings.

ENVIRONMENTAL DESIGN STRATEGIES (15 credits)

Building on the contents of the first module, this module extends the heat flow theme and explores how environmental strategies are expressed in the traditional passive approaches that have been used to temper the environment within buildings in response to a prevailing climate. An analytical understanding of these strategies is developed through the introduction of modelling / simulation tools with students exploring the role and applicability of these tools at all stages in the design process.

TALL BUILDINGS, URBAN DESIGN, CLIMATE AND THE ENVIRONMENT (15 credits)

Continuing the theme further, this module explores how the concepts and strategies introduced can be applied to architectural design and in particular tall buildings. The design of tall buildings differs significantly to that of low-rise buildings whereby certain elements such as core design, plan form, organisation of program, structural systems, circulation, façade design, ground floor interface, etc, have to be uniquely considered in detail. Similarly, the urban realm within which tall buildings are placed and the creation of open spaces within them also requires specific design knowledge. This module introduces these elements and provides detailed information which is crucial to the design and understanding of tall buildings and vertical urban design. In particular it examines how tall buildings can better respond to the climate, context and culture of their place and how integrated design strategies and technologies can enhance their environmental performance and sustainable credentials.



DESCRIPTION OF MODULES

ARCHITECTURE, CLIMATE AND THE ENVIRONMENT (30 credits)

This studio-based module concludes the first year of studies and explores how the concepts, environmental design strategies, tools and techniques introduced previously are applied in architectural design. It introduces the integrated design process and explores the development and testing of strategies from initial site / context analysis through to simulation and verification of results. As such, it places emphasis on exploring and applying within the design process key issues such as daylighting and solar control and the thermal and ventilation processes used to control / moderate indoor (and outdoor) climates.

RENEWABLE ENERGY DESIGN (15 credits)

This module introduces and examines the various sources of renewable energy technologies suitable for use in the built environment. Concentrating on solar, wind, water, geothermal and biomass as potential sources of energy, it investigates the contribution they can make to help offset a building's energy requirement, the technology used to harness them and limitations associated with their use. Students will therefore acquire knowledge of the principles of operation, design and analysis of renewable energy technologies covered so that they can be implemented appropriately at the design stage.

ENERGY EFFICIENT TECHNOLOGIES (15 credits)

This module provides students with knowledge of the principles of operation, design and analysis of various energy efficient technologies that provide heating, cooling and power in buildings. Focusing on developing an understanding of the range of energy efficient technologies, techniques and processes available for reducing energy-related environmental impacts, it covers a number of topics including power generation and supply, refrigeration and air conditioning systems, energy recovery systems, heat pumps, combined heat and power systems, cooling systems, boilers and heat distribution systems. As such, students will develop the knowledge and understanding required to perform a rigorous technical analysis of energy efficient technologies, therefore identifying key techniques and opportunities associated with energy efficiency and their associated reduction in CO₂ emissions.



DESCRIPTION OF MODULES

ENERGY EFFICIENT DESIGN (15 credits)

Given the importance of early decision making within the design process, this final taught studio-based module reflects on all modules undertaken and explores how the concepts, passive and active design strategies, energy technologies, tools and techniques introduced can be applied to the holistic design of a 'sustainable' building. The module encourages students to apply the key knowledge gained and to develop integrated design skills, either through case studies or design projects. To achieve this, it explores some of the numerous decisions and interdependencies associated with integrated sustainable building design and how these can be assisted through the use of computer-based prediction, decision support and design techniques. On completion of this module, students are expected to explore the development and testing of strategies from initial site / context analysis through to simulation and verification of results.

DISSERTATION IN SUSTAINABLE BUILDING DESIGN (60 credits) – SUMMER OF FINAL YEAR

The programme concludes with students conducting a significant piece of focused written research that examines in detail a topic related to sustainable building design. Supervised by academic staff from the University of Nottingham, students are encouraged to engage in topics that are relevant to their professional career, their practice or industry as a whole. Students are therefore expected to select a topic of inquiry, search and critically review the appropriate literature, develop appropriate research questions, plan a methodology for investigation, collect data, rigorously explore and analyse it, interpret its findings against what is already known in the field and critically evaluate and reflect on the study itself.





DEPARTMENT OF ARCHITECTURE AND BUILT ENVIRONMENT, FACULTY OF ENGINEERING, UNIVERSITY OF NOTTINGHAM, UNITED KINGDOM

The University of Nottingham's position as a world-class University is confirmed by its ranking in global league tables. Ranked in the UK top 10, the European top 30 and in the top 1 per cent of all universities worldwide, it is a research-led University recruiting top students and staff from around the world. Being part of the Faculty of Engineering, the Department of Architecture and Built Environment aims



to recruit and inspire highly-skilled graduates to enable the transition towards a more sustainable, economically beneficial, low carbon society. Focusing on interdisciplinary teaching and research in the fields of Architecture, building technology, sustainable and renewable technologies and urban design, its academic staff, graduate architects and engineers are in high demand and at the forefront of new developments in these areas. They are working on new approaches to sustainable design and pioneering new technologies that will change the way homes, workplaces and urban settlements are designed and built. As such, both the former Institutes of Architecture and Building Technology have been ranked number one in the UK in previous league tables published in the Times Higher Education Supplement.

The University of Nottingham has adopted a clear, long term vision of investment in people, research and teaching and plans to play an important role in creating the next generation of elite architects and engineers.

BCA ACADEMY OF THE BUILT ENVIRONMENT

The BCA Academy of the Built Environment is the education and research arm of the Building and Construction Authority, Singapore. Founded in 1984, the Academy offers a wide range of training and education programmes tailored to the needs of the building and construction industry. These programmes include programmes for professionals, management and executive personnel, and technical specialists.

In support of the national effort to transform Singapore into a green and sustainable global city, the Academy has initiated several training programmes to nurture and develop managerial and technical capability in such niche areas as green building design and technology, renewable energy, and sustainable facility and environment management. To enable our industry leaders and practitioners to learn from the experience and knowledge of leading experts, the Academy collaborates with established tertiary institutions (such as Carnegie Mellon University, Singapore Management University, UniSIM, University College London, Nottingham University and HFT Stuttgart University) to conduct degree and post-graduate degree programmes, and executive programmes.



BCA ACADEMY
of the built environment

ADMISSION CRITERIA

The applicant must have a recognised degree in a subject related to the built environment. All applications are subjected to approval by the University of Nottingham.

FEE

The programme fee for the two-year programme is SGD 22,500 (excluding GST) before subsidy. The programme fee may be paid in 3 instalments. In addition, a one-time application fee of SGD 50 (non-refundable) will have to be paid at the point of application.

SUBSIDY

Subsidy is available for Singapore Citizens and Singapore Permanent Residents who are in the building industry.

The subsidy details are as follows:

	Funding Level	Fee Payable (includes GST)
Singapore Citizens	75%	SGD 6,018.75
Singapore Permanent Residents	60%	SGD 9,630.00

Candidates who are keen to apply for the subsidy must submit the following documents to BCA Academy by 18 March 2012:

- i. Application Form for MSc (SBD) Course Fee Subsidy
- ii. Certification letter from company stating candidate's designation and date joining the company

The application form for course fee subsidy is downloadable from: <http://www.bcaa.edu.sg/MScSBD.aspx>

Subsidy places offered are subject to availability.

AWARD

Participants who satisfy the assessing requirements of the respective modules and their dissertations will be awarded the degree of Master of Science in Sustainable Building Design. Such award, including transcripts, will be the same as those conferred for studies on campus at the University of Nottingham.

GREEN MARK PROFESSIONAL

Graduates awarded with the MSc in Sustainable Building Design degree are eligible to apply for Certified Green Mark Professional (GMP) if these requirements are satisfied:

- completed one Green Mark Gold^{PLUS} project at the point of application; and
- fulfil other criteria for GMP registration as stipulated in http://www.bca.gov.sg/GreenMark/gm_manager.html

REGISTRATION

To apply, please fill up the application form which is available at <http://www.bcaa.edu.sg/MScSBD.aspx>. Then, mail the completed application form, together with copies of academic transcripts and degree, two reference letters, curriculum vitae, colour photo and application fee to:

BCA Academy
200 Braddell Road, Singapore 579700
Attention: Ms Too Siew Choo

Application closes on 18 March 2012. The Programme commences on 5 September 2012

All information in this booklet is correct at the time of printing. Please log on to our website at www.bcaa.edu.sg/MScSBD.aspx for updated information.

“ I hope to put the knowledge gained to good use in my work. This being a part-time course means that we could apply what we have learnt in class in our day-to-day work. ”

- **TAN SHAO-YEN,**
*Executive Vice President,
CPG Consultants Pte Ltd
(Participant of 2009 Cohort)*

“ I found Dr Sergio Altomonte remarkable! Despite the weighty issues he had to deal with, Dr Altomonte kept the pace fast. His light-hearted approach also kept the various parameters of the environmental design interesting, which really helped us appreciate and develop a full understanding of the subject. ”

- **TERENCE TAN,**
*Regional Service Manager
(Building Efficiency),
Johnson Controls
(Participant of 2009 Cohort)*



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