2022-1

Building Performance - Societal Drive, Programme and Symposium

Joseph Little
Technological University Dublin, joseph.little@tudublin.ie

Patrick Daly
Technological University Dublin, patrick.daly@tudublin.ie

Recommended Citation

Little, J., & Daly, P. (2022). Building Performance - Societal Drive, Programme and Symposium. Royal Institute of Architects of Ireland (RIAI). DOI: 10.21427/YZYN-B471

Architecture Ireland Journal, Issue 321, January 2022

BUILDING PEFORMANCE – SOCIETAL DRIVE, PROGRAMME AND SYMPOSIUM

Joseph Little MRIAI, MSc Arch AEES, BArch *
Patrick Daly MSc Arch AEES, PG Dip (ProjMan), BEd, Dip ArchTech *

** School of Architecture, Building & Environment, Bolton Street*
Technological University Dublin, D01 K822, Ireland

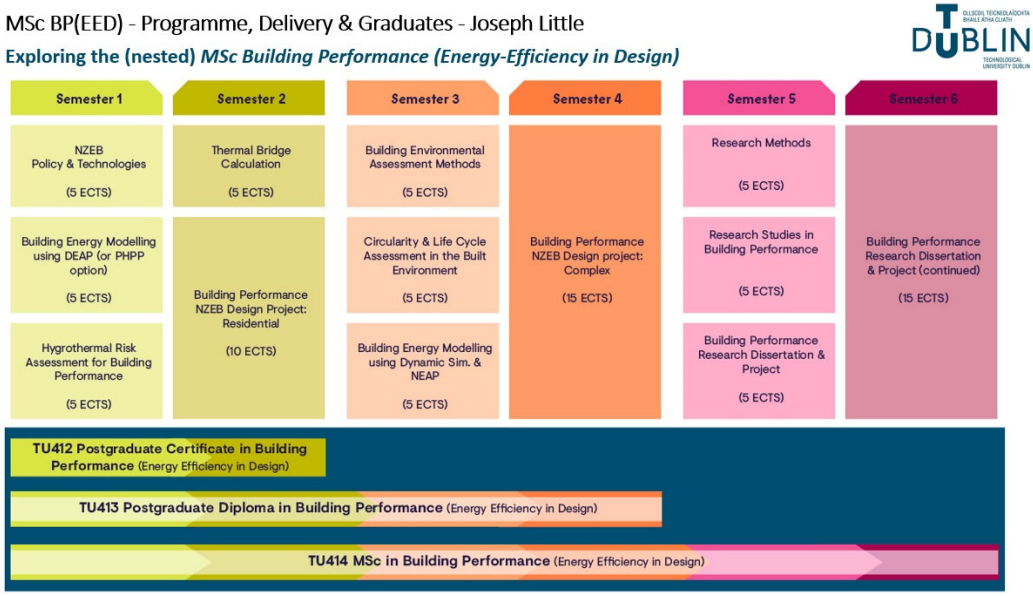
Society is increasingly looking at the construction industry to mitigate the environmental crisis and solve the housing crisis through wholesale embrace of three broad sets of challenges: (a) digital technologies and modern methods of construction supporting a 'lean' agenda; (b) renewable energy generation and storage combined with energy efficiency of all building types; and (c) specifications and systems that reduce the environmental impacts of buildings with big increases in the circularity of materials and components. The radical and urgent nature of each of these challenges is such that the construction industry must, and will, be very different in ten years' time. Inter alia, three documents that reflect the challenges are *A Detailed Description of Needs for the Irish Construction/Built Environment Sector* from Enterprise Ireland, *Ireland's Long-Term Renovation Strategy 2020* from the Irish government, and *Guide to The United Nations Sustainable Development Goals* from Business in the Community Ireland.

Architectural practices hold a unique position to show leadership in these challenges but will lose ground quickly if they don't seek to build teams in-house with the skills that are required. Given the necessity to achieve ambitious national and international targets by 2030 and carbon neutrality by 2050, significant and widespread upskilling by those who currently design and specify new buildings and renovations is not just a topic for technical 'boffins' or boardroom discussion, it's a societal imperative. This is why for the last few years the government has been willing to provide 90% fee subsidies through Springboard+ to employed building design professionals who seek to upskill in building performance and BIM-focused postgraduate programmes. TU Dublin is proud to offer some of the leading programmes in both fields.

MSc in Building Performance

The MSc in Building Performance (Energy Efficiency in Design) (MSc BP(EED)) was created in 2017 to provide significant upskilling in the knowledge, skills, and software applications that support the creation of compliant, sustainable, super-low energy, new and renovated buildings by design teams. It had its first intake in September 2017 and is now in its fifth year. About 40% of each cohort have been architects and ~25% architectural technologists. The remainder of the cohort are primarily engineers. The programme has its origins in the RIAI CPD in Designing Low Energy Domestic Refurbs (2010) and DIT's Postgraduate Certificate in Digital Analysis and Energy Retrofit (2011). The latter developed to a three-stage masters, then closed due to the return to full employment. The EU-funded MEnS Project allowed DIT to transition to a blended online model that underpins the delivery of the current programme.

MSc BP(EED) is a three-year programme with a ‘nested’ structure. This means that students can take a range of individual six-week long modules as CPD certificates; undertake one year of upskilling to graduate with a Postgraduate Certificate BP(EED); upskill over two years to graduate with a Postgraduate Diploma BP(EED) or continue to Year 3 in a focused piece of research to graduate with the full MSc BP(EED). The online delivery model is fundamental to the ability of busy building design professionals being able to upskill. TU Dublin provide a suite of online resources (website, social media platform, videoed lectures) and a flipped classroom pedagogy with plenty of feedback to support deep learning. Various features also provide some level of flexibility – essential to students balancing family, work and college needs. An average student should allow a time commitment of around twenty hours per week during the teaching weeks and about ten hours per week for the project weeks.



Programme structure of the nested MSc in Building Performance (Energy Efficiency in Design)

Learning journey

Year 1 teaches knowledge, skills, and evaluation tools that address regulatory, operational energy and building fabric concerns in four taught modules, concluding in a large building design evaluation project, which provides a chance to integrate the use of those skills and tools. Students who engage in this year not only gain significant insight into the legislative context and design challenges toward nZEB targets (residential focus) but also develop essential knowledge and skill in the use and application of an array of energy, thermal, and moisture assessment tools. The challenging end-of-year design project is based on a case study that students select from their own practice experience. In this project, they examine and model a range of potential energy efficiency design strategies, critically appraising suitability and application to real world contexts. They also undertake in-depth assessment of technical issues relating to the thermal and moisture performance of the fabric, such as insulation type and location, complex junctions, moisture risks, etc. The finished work is presented as a report and graphic architectural poster.

Year 2 broadens to address a range of environmental concerns, including life cycle assessment and building design for circularity, as well as dynamic simulation and non-domestic building energy modelling. It concludes in a full-semester building design evaluation project. During this year students not only develop further knowledge and skill in relation to both environmental and advanced energy analysis but they examine and explore complex design challenges relating to dominant current issues and problems in real life, practice-related studio projects, including energy, environment, and circularity requirements. In terms of energy efficiency, students move from a heat loss design focus (in Year 1) to grapple with more complex interplays of energy, thermal comfort, and daylight, and they explore how passive architectural strategies (thermal mass, shading, daylight, ventilation) can be applied to optimise performance. Additional complexity is added by the necessity to give increasing weight to environmental impact and the emerging area of building circularity (each of which has their own methods and modelling approach). The semester-long project produces work of high-quality and real-world applicability that is invaluable for design offices. It can also 'springboard' ideas that may be explored through supported research in Year 3.

Students Brian Carey (TU412 PG Cert BPEED), Sara Carrigan (TU413 PG Dipl BPEED) and Keith Farrell (TU414 MSc BPEED) being awarded the Sir Richard Morrison Student Excellence Prize in Summer 2022

In the third and final year of the programme, students have the opportunity to undertake advanced research into a particular building design performance issue, potentially drawing from subjects studied earlier in the 'nested' programme or from practice. The scope and depth of the research dissertations that students produce touches on key areas of design and practice knowledge such as ventilation and health in classrooms during a pandemic, life cycle assessment of alternative retrofit strategies, moisture risks associated with EWI in Irish construction, and combined energy-environmental impact assessment that challenges the 'demolish or retain' debate.

Fee subsidy & environmental accreditation

TU Dublin is confident that the Springboard+ subsidy will be available to students of PG Cert BP(EED) for a fifth time this summer, allowing another cohort of forty to fifty building design professionals to avail of significant upskilling over one year for only €250. It is advisable that interested parties should record their interest with Dublin School of Architecture. Successful applicants are advised to consider the subsidy as an upfront investment by the Irish State in a two-year upskilling journey, allowing them to graduate from the PG Diploma BP(EED) with a full suite of building performance skills. Alternatively, the CPD Certificates in Thermal Bridge Calculation and NZEB Policy & Technologies (taking place this Spring) could be considered. Besides providing important upskilling, they will give interested parties a sense of the resources TU Dublin provides and their ability to upskill for longer.

Because the RIAI recognises that the built environment has a major impact on the sustainability of global systems it provides environmental accreditation to those who upskill in MSc BP(EED) or its constituent parts.

Symposium

To celebrate five years of our students upskilling and the first cohort of MSc graduates, TU Dublin will host a Building Performance Symposium this spring. Graduates of Years 1, 2, and 3 will be the main speakers, presenting impressive and relevant work that supports the transformative agenda now underway. We believe it will be particularly insightful for decision makers in architectural practices to attend. The Symposium will take place live and on campus in the Michael O'Donnell Theatre, TU Dublin Bolton Street, 2-5.30pm, Wednesday 16th March. Watch this space!