



JOINT BOARD OF MODERATORS

ANNEX C – SUSTAINABILITY IN DEGREE PROGRAMMES

Context

The JBM requires that sustainable development be integrated into existing teaching and learning, and must be pervasive throughout the engineering education programme; a thread of sustainability will therefore run through the programme.

Engineers should be able to respond to societies' concerns about the impact of human activity on the environment. There is an increasing demand from governments and the public that this environmental concern is placed in the context of achieving the correct balance between environmental, social and economic outcomes within the overarching concept of sustainable development.

Aims

Students will become tuned to the need to design and engineer projects which minimise our impact on the environment, and which enhance humankind's endeavours in a sustainable manner.

Knowledge and understanding

The thread of sustainability running through the programme should enable a student to:

- Be aware of the implications of climate change, international protocols associated with climate change, and the low-carbon agenda and how it impacts on engineering design, construction and operation.
- Ensure that they take account of the context of environmental, economic, political, interdisciplinary, global and social issues, and other dimensions including ethics and environmental justice in dealing with engineering problems.
- Develop an awareness of the use of environmental management systems, environmental impact assessment and social impact assessment and how they are used on engineering projects.
- Be aware of resource scarcity, and the need to limit energy dependence.
- Be aware of sources of environmental, social, political and economic information and their application to the above.
- For those studying structural engineering an awareness of building physics.
- Demonstrate through design studies, projects, coursework and/or examinations a strong awareness of carbon critical design and construction.

Intellectual ability

The student should be able to

- Provide an interdisciplinary perspective on the practical problems associated with sustainability.
- Appraise build options in the context of the sustainability agenda.
- Look beyond technical design solutions to impacts on local stakeholders.
- Assess and mitigate environmental risk in given examples ¹
- Demonstrate knowledge of energy supply, and waste & water management.
- Demonstrate knowledge of life-cycle assessment, sustainable communities and related infrastructure.
- Develop a holistic approach to design.

Practical skills

The student should be able to:

- Demonstrate through design work, project, coursework and/or examinations a strong awareness of and commitment to the principles of sustainable development as outlined above.

General transferable skills

The student should be able to:

- Produce solutions to problems which are profoundly interdisciplinary in nature.
- Appreciate the importance to society in general of the impact of human activity on the environment.
- Communicate knowledgeably about sustainability issues especially to those with a non technical background.
- Be able to assess the capital and operational carbon content of civil engineering projects.

Method of teaching, learning and assessment

Teaching of sustainability should be embedded throughout many aspects of the taught curriculum, including design projects, dissertation projects, coursework and examinations. Where the subject forms the focus of a particular unit, case studies of (and site visits to) particularly good examples of projects where the ethos of sustainability has been embraced profoundly should be considered.

The JBM recommends that the three sets of guidelines (Annexes B, C & D) be considered together, especially in relation to teaching and learning methodology and assessment.

¹ For example flood risk including vulnerability of schools, hospitals etc; slope stability and risk.