



## Sustainable Computing MSc (in development)

The School of Computing, Informatics and Media's MSc/MEng in Sustainable Computing is a course designed to provide high level, skilled, cross-disciplinary graduates in sustainable computing, ready for leading roles in industry, public services and NGOs, with the requisite knowledge and expertise to tackle the environmental issues presented by evolving computing technologies head on.

### Introduction

The UK government has recently predicted the development of over 400,000 new "Green" jobs. Similarly, there are a growing number of computing technology companies that have active and ongoing energy efficiency initiatives (Frost & Sullivan, 2010) such as Microsoft (Microsoft, 2008), IBM (IBM, 2010), Cisco (Cisco, 2010) and HP (HP,2008) to name but a few, which are driven by consumer and legislative demand. Given that the carbon output of computing technology is as high as aviation and rising at a faster rate, the efficacy of the efforts of computing companies in terms of achieving genuine advancements in sustainable practices need urgent examination. Widely discussed global trends which include increased energy insecurity, a depletion of natural resources and the destructive side-effects of past industrial practices, not to mention predicted climate chaos, is driving demand for renewable and sustainable technologies worldwide (Reder, 2010). In addition there is a growing recognition that we may not simply be able to 'engineer' our way out of the situation with 'techno-fixes', but instead need to challenge and critically examine many of our existing patterns of behaviour. There is a, corresponding and expanding market for personnel well versed in the effects of large scale computing systems on the environment, and how to fundamentally positively exploit IT and other technologies to support and actually improve long term prospects for sustainability (Allan, 2009).

### Programme Aims

This postgraduate programme in sustainable computing enables students to develop an advanced level of understanding, experience and proficiency in sustainable computing, design, technologies, environmental science and key related cultural, ethical and political issues, to produce highly prized and sought after employees that are industry prepared. The course of study spans a broad range of topics that together encompass and underpin sustainable design for computing to safely and responsibly negate the potential for hazardous environmental impacts of existing and contemporary ICT technologies, whilst similarly ensuring their most efficient and productive use. The research component of the course enables students to develop an effective range of project management, organisational, communication (including reporting and presentational) and problem solving skills that are highly prized in industry and provide an appropriate foundation for progression on to our catalogue of advanced research degrees at the School such as access on to our renowned doctorate programmes.



*Sustainable Computing is a vital supporting technology, helping develop computing systems architecture which enables a step change in improving ecological and energy efficiency. This will ensure we are better placed to tackle energy insecurity, climate chaos and improve human well being.*



Dr Sayed Kazmi  
(Director of course development)



## Sustainable Computing MSc (in development)

### Programme Learning Outcomes

Successful completion of this postgraduate course of studies will ensure students are developed to a satisfactory proficient standard to provide high quality employees within industry that evidently both understand and respect the various technological developments currently in use and importantly the environment that they are exploited within, in a socially correct and highly responsible manner. Please refer to the "Course Structure" Section for specific details.

### Knowledge

This course will enable students to recognise, assess and exploit current computer related systems, apparatus, technologies and techniques, and provide methodologies for enhancing their best effective use in order to negate or reduce their potential impact on the environment and actually help empower students in their desire to do so.

### Understanding

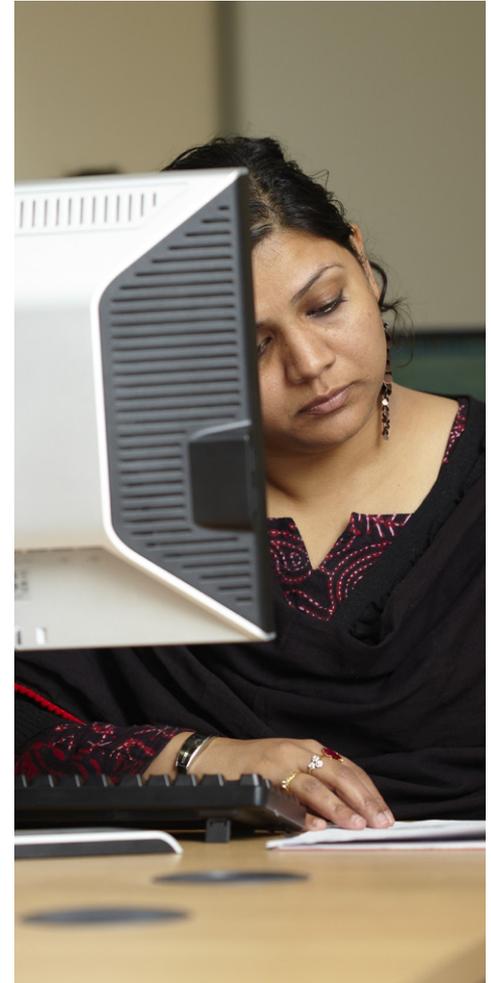
Ensure students are aware of the various current interrelated issues and developments in computing, engineering, society, culture and the political economy, and be able to analyse fundamental systems requirements (from permaculture to object-oriented programming). Consequently they will understand how to design effective contemporary computer based systems.

### Application

Ensure that students are able to appropriately apply the knowledge and understanding gained in a professional content and additionally are also able to comfortably conduct high level research into the latest developments in socio-technical computing. Specifically, related to ensuring the adoption and development of innovative concepts, techniques, tools and applications for the support of sustainable computing, through the critical assessment of the latest modern research material and 'real world' case studies.

### Personal and Transferable Skills

- Practical
- ICT Skills
- Technical and mathematical skills,
- Time management and organisational skills
- Project and service management skills such as context-based problem solving
- Social
- Ethical and social critical and discursive Skills
- Communication skills (report writing, presentation, facilitation and negotiation).
- Working as part of a team
- Sustainability evaluation tools
- Curriculum (MSc Route)



Module Code	Module Title	Type	Credits	Level	Study period
	Sustainable Computing Technology	Core	20	M	Sem A
	Critical Contexts: Computing for the Environment	Core	20	M	Sem A
	Optional Elective A	Optional	20	M	Sem A
	Developments for Sustainable Computing	Core	20	M	Sem B
	Frameworks for Sustainable Computing	Core	20	M	Sem B
	Optional Elective B	Optional	20	M	Sem B
	Research Dissertation and Project	Core	30	M	Sem B
	Research Dissertation and Project	Core	60	M	Sem C