

What does Education for Sustainability have to do with Civil, Maritime and Environmental Engineering?

"We provide industry with innovative solutions to their problems, train the engineers, audiologists and environmental scientists of the future, and impact on society through our world-leading research." (<http://www.southampton.ac.uk/engineering/about/index.page?>)

The world's growing population puts additional pressure upon our infrastructure, global shipping, particularly in the face of progressive urbanisation and extreme weather events associated with anthropogenic climate change. Topic areas of relevance to sustainability already in the Civil, Maritime and Environmental Engineering curriculum include:

- **Resources management:** material choices and energy use in construction; control of groundwater during construction; water resource management.
- **Renewable energies:** engineering solutions to energy and power problems; development of fuel cell and photovoltaic systems; exploiting wind (off and on shore), ocean wave and marine currents for energy generation; understanding the risks and opportunities for nuclear energy; the principle barriers to hydrogen economy.
- **Environmental impact:** minimising waste from industrial to domestic sources; environmental considerations in the treatment of waste; threat to marine ecosystems from anti-fouling paints on boats; coastal flood defence.
- **Design and innovation:** energy performance of new buildings.
- **Geography of design:** design that is sympathetic to the surrounding natural environment; selecting materials from the local environment; coping with environmental, social and economic impacts of geohazards and extreme events e.g. increased flooding associated with anthropogenic climate change.
- **Management and law:** ensuring compliance with the ethical and environmental concerns embedded in business management and law; corporate social responsibility.
- **Human impacts:** optimising the design of things to account for the characteristics and capabilities of the people using them; improving human health and wellbeing e.g. in building design.
- **Future thinking:** developing technologies and their future potential.
- **Ethics:** consideration of ethics in research and in industry; safety and regulatory factors in design.

Key skills for civil, maritime and environmental engineers which sustainability teaching cultivates:

interdisciplinarity; informed decision-making; synthesis of different opinions, theory and data; debate and reasoning; teamwork; leadership; problem-solving; oral and written communication; self-management; time-management; critical thinking; future thinking; project management; risk management; entrepreneurship.

Find out more: Contact Julia Kendal (j.kendal@soton.ac.uk) for more information including case studies on teaching sustainability in this area.