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Ollscoil Teicneolaíochta an Oirdheiscirt

South East Technological University

Module Descriptor

Human Centred Systems (Computing and Mathematics)

Human Centred Systems (A14062)

Short Title: Human Centred Systems
Department: Computing and Mathematics
Credits: 10 **Level:** Postgraduate

Description of Module / Aims

The key success factors associated with the effective design, development, deployment and use of advanced digital information technologies are primarily non-technical, human factors associated with complexity in either the systems that are needed, the context in which the system is being deployed, or both. When not addressed these factors impinge upon both technical development activities and systems management processes in unexpected ways and often contribute to high levels of systems failure or result in systems which fail to meet their objectives. The challenge for systems professionals is to design and use systems development methodologies that create viable, effective, sustainable systems that support modern organisations and their decision making processes in all their complexity. This course reviews key success factors in systems development and recognises that the successful deployment of information systems in the enterprise requires a holistic approach to systems design, delivery and management which recognises how people, organisation and technology can be combined to create effective systems for decision making and other management functions.

Programmes

		stage/semester/status
COMP-0618	MSc in Computer Science (Enterprise Software Systems) (WD_KCESS_R)	1 / 0 / E
COMP-0618	MSc in Computing (Information Systems Processes) (WD_KISYP_R)	1 / 0 / E

Indicative Content

- Introduction to Important Ideas in Systems Theory and Cybernetics
- Complexity Theory and the challenges of complex systems for systems professionals and research
- Critical assessment of alternative information systems development paradigms and approaches
- Applied Systems Thinking and Practice: practical guidelines and techniques for developing human-centred information systems; addressing complexity, uncertainty and ambiguity; design of appropriate systems evaluation metrics; crafting advanced applied systems methodologies
- Case Studies of complex information systems development and applications

Learning Outcomes

On successful completion of this module, a student will be able to:

1. Justify human-centred systemic factors in the overall context of the Information Systems Development discipline as a whole.
2. Evaluate the implications of complexity and related concepts for information systems engineering activities.
3. Organise appropriate human-centred systems techniques and principles in a given systems context.
4. Appraise human centred systems principles in complex computing-related projects.
5. Critique the leading edge research debates in information systems development and systems management.
6. Critique applied systems thinking in the work of systems professionals and systems research.

Learning and Teaching Methods

- The course is designed to inculcate in students a deep appreciation and understanding of applied systems thinking and how it can be deployed in a variety of situations which systems professionals are likely to encounter either in research or practice.
- Academic readings and practical reports will be prepared and provided for students as part of the course readings materials.
- This course will combine presentation of important theories with a range of practical working activities which explore and unpack the implications of those theories for computer science, information systems and the work of systems professionals and research.
- Key delivery modes will include lectures, group work, practical sessions and workshops. Case studies and other non-didactic methods will be used in delivery.
- The practical programme will include seminar and workshop sessions e.g. exchange of ideas, methods workshops, portfolio preparations, case study work of systems development situations which will be explored in class.
- Students will submit a portfolio-type report comprising the various activities completed during the course for continuous assessment.

Learning Modes

Learning Type	F/T Hours	P/T Hours
Lecture	36	36
Workshop	12	12
Independent Learning	222	222

Assessment Methods

	Weighting	Outcomes Assessed
Continuous Assessment	100%	
Portfolio	50%	2,4,6
Assignment	50%	1,3,5

Assessment Criteria

<40%: Unable to explain the fundamentals of applied systems thinking. Inability to demonstrate a rudimentary understanding of basic concepts associated with systems development or provide a rudimentary assessment of approaches to solving issues in ISD. Inability to demonstrate the capacity to personally reflect on their learning and its implications for them as systems professionals or in a similar sphere.

40%–59%: Demonstrate an understanding of human-centred systems development approaches. Understand the characteristics of the various techniques and theories presented in the course, and be able to practically apply these in context. Be able to reflect on own learning experience to a basic level but not necessarily with deep insight.

60%–69%: All of the above and in addition being able to apply the approaches to complex problems. Demonstrate ability to critically apply major frameworks presented in this module, and how these can be utilised and tailored to address a wide range of specific problems in systems engineering management. Be able to critically reflect on own learning experience with some deep insights.

70%–100%: The above to excellent level. Be able to critically assess the strengths and limitations of particular methods associated with developing systems in that context. Be able to assess trends in the field of information systems development and how HCS approaches address these trends. Demonstrate a deep level of critical refelction on the theories, methods and praxis presented in this module.

Supplementary Material(s)

- Checkland, P. *Systems Thinking, Systems Practice*. New York: Wiley, 1999.
- Gharajedaghi, J. *Systems Thinking, Third Edition: Managing Chaos and Complexity: A Platform for Designing Business Architecture*. North Holland: Elsevier, 2011.
- Gill, K. *Human Machine Symbiosis: The Foundations of Human-centred Systems Design*. London: Springer-Verlag, 1996.
- Holland, J.H. *Complexity: A Very Short Introduction*. Oxford: Oxford University Press, 2014.
- Page, S.E. *Diversity and Complexity*. NJ: Princeton University PRess, 2011.
- Reynolds, M. and S. Howell. *Systems Approaches to Managing Change*. London: Springer, 2010.
- Steen, M. *The Fragility of Human-Centred Design*. Amsterdam: IOS Press, 2008.
- Taleb, N.N. *Anti-Fragile: Things that gain from disorder*. New York: Allen Lane (Penguin), 2012.
- Zokaei, A. and J. Seddon. *Systems Thinking: From Heresy to Practice*. Basingstoke, England: Palgrave Macmillan, 2011.