

Complex Systems Toolkit

Key talking points



COMPLEX SYSTEMS

WHY?

- Today's engineering challenges involve an increasing range of technical and non-technical factors that interact in non-linear and unpredictable ways. This requires developing graduates who can collaborate across disciplines and navigate complexity, and manage complex systems, not just solve technical problems in isolation.
- The Complex Systems Toolkit addresses critical gaps in engineering education by equipping students with the skills to design systems that are not only technically sound but also resilient, trustworthy, and ethically robust. These are essential competencies for future engineers.
- Integrating complex systems into engineering teaching aligns with professional standards and accreditation requirements, and also complements institutional goals around interdisciplinarity, sustainability, and EDI.
- Engineering educators themselves need to continually learn and adapt their teaching in response to innovations in technology and educational practice, but they often need resources and support to guide them in doing so. The Toolkit provides an opportunity for extending the skills and practices of engineering educators.

WHAT?

- The Toolkit provides guidance on how systems thinking is critical in an interconnected world.
- The Toolkit provides accessible, practical resources for embedding complex systems into engineering education. Bridging technical excellence and real-world contexts, it prepares students for the multidisciplinary challenges they'll face in industry.
- The Complex Systems Toolkit contains resources that clarify essential terminology, outline key competencies, scaffold learning outcomes, and outline effective teaching strategies and activities that are ready for instant use in the classroom.

HOW?

- Developed through global collaboration from an interdisciplinary team, the Complex Systems Toolkit reflects expertise across academia and industry and is shaped to evolve through community input and feedback.
- Engineering educators will find the toolkit accessible and easy to use regardless of their level of experience teaching complex systems concepts.