

# ONLINE Short Course

University of Canterbury College of Engineering is now offering critically timed training for Engineering Professionals in any discipline.

[INTRODUCTION VIDEO](#)



## Energy transition engineering, management and policy

Learn to move your perspective, get un-stuck from the Business-As-Usual, and discover the real value creation in carbon downshift.

**Qualification:** Transition Engineering Professional MGATE  
**Duration:** 6 Modules, start at any time  
**Contact Time:** 40 CPD hours, self-paced  
**Fees:** GBP 300 (\$600 +GST NZD)

Global warming, resource constraints, pollution, environmental destruction, and now the COVID-19 pandemic means a rapidly changing understanding of the role of engineers. This course will prepare you to contribute to the transition of all current systems and operations. There has never been a greater need for engineering to respond to the challenges of mitigation and adaptation.

One business leader explained why they supported their team to take the course:

*"We need help with the complex problems of transition to zero carbon while managing all of the pressing demands of our core business and rapidly changing business and social context."*

In times of uncertainty and disruption, policymakers, business managers and communities will need Transition Engineers in all fields to help with the massive transformational changes required.

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## Course structure

**Introduction** - What is the role of engineers in changing the future? Can you save the Titanic?

**Module 1 - The Mega-Issues of Unsustainability**

Accumulation of Greenhouse Gas, Fossil Fuel Supply, but particularly the problem of Peak Oil. The Monkey Trap

**Module 2 - Problems of Unsustainability**

Sustainability Principles, Carrying Capacity, Resource Constraints, Population, Water, Lifestyle Expectations - but mostly the problem of Exponential Growth. Bacteria in the Jar

**Module 3 - Complexity and Communication**

Numerization is the key to cutting through the emotion and nonsense. Finding good data and making straightforward investigations. Presenting energy data in graphs and figures and exploring future scenarios. A look at Hydroelectric power and geothermal power - the biggest renewable electricity potential by far. The Fox and the Hedgehog and the Bigger Picture

**Module 4 - Transition Engineering**

The Interdisciplinary Transition Innovation, Management and Engineering (InTIME) methodology and how to use it for wicked problems. The Wickedest Problem: Transport. Blind Men and the Elephant.

**Module 5 - InTIME Models and Methods**

Theory of Anthropogenic System Dynamics, Development Vector, Strategic Analysis of Complex Systems. A look at Electricity and the wicked problem of getting what we want. InTIME Example – the City of Dunedin, reduce oil use 50% by 2050.

**Module 6 - Economic Decisions, Transition Economics**

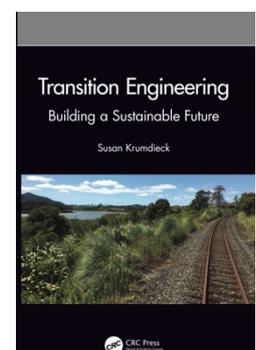
Cost of Energy, Environmental Externalities and Health Effects. Standard economic analysis. Emperor's New Clothes. Energy Return on Energy Invested (EROI) and other ways to look at the future. Low-Hanging Fruit. The Matrix Game and taking the red pill - The Big DO

**Projects** – Participants apply the InTIME Method to a wicked problem in their community or organization.

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## Expectations for the Transition Engineering course

- Start any time, progress at your own pace
- 6 Modules delivered on line with live lectures delivered to a class at Canterbury University and recorded for on-demand viewing
- Each Module has 3 lectures, podcasts, examples, and modelling resources
- Participant community discussion forums and tutor support
- Participants will practice the InTIME Methodology on a wicked problem in their own community or company
- Companion text, *Transition Engineering, Building a Sustainable Future*, CRC Press, 2019. Use voucher code FLR40 for 20% discount.



## Course Designer & Presenter: Professor Susan Krumdieck

The founder of the Transition Engineering movement, Professor Susan Krumdieck leads a global community of learners and do-ers. Prof. Krumdieck has BS in Mechanical and Aerospace Engineering, MS in Energy Systems Engineering, and PhD in Advanced Materials in Mechanical Engineering for Energy Systems. Transition Engineering has developed from more than 50 journal papers and more than 30 postgraduate student's research projects in a wide range of sustainability projects.



As more and more engineers learn the approach, methodology and tools of Transition Engineering, key novel technologies and systems are emerging. The students in this class also form the community innovating the pathway to the future the students are asking for.

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## It is more than a short course - it is a community and a movement

- In October, participants will be invited to attend workshops in Auckland, Wellington, and Christchurch to develop shift project proposals
- The "Investment Ready Shift Projects" developed by the participants will be showcased in a new Transition Mosaic
- In November, the participants will present their projects and hold a Convergence with other Transition Engineers from around the world.
- Participants who successfully complete the course and a project can apply for
- Transition HQ is a new Collaborative Hot Desk where economists, councils and organisations can access Transition Engineering services from a range of universities and consultancies.

## Get started now

If you are a CEO or manager and employ engineers, this course can help your organisation navigate the unprecedented changes to what we used to consider 'normal'. We strongly suggest that you enrol a team of engineers in the course. We strongly suggest that you offer enrolment in the course and innovative freedom to young top talent in your organisation. The learning outcomes include working knowledge of the Interdisciplinary Transition Innovation, Management and Engineering (InTIME) Methodology and key strategic analysis tools. You will gain confidence in the face of what seem like entrenched positions and impossible problems. By the end of the course, you and your organisation will be much more prepared to discover opportunities for transition and to adapt to the future trends in energy and economic downshift.

If you are an academic lecturing in any subject, you can add Transition Engineering into your course by preparing your own lectures or by organizing a group enrolment for your students in the on-line course.

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