



Integrated Energy Systems

8 weeks, starting 7 July 2025



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD



Transforming
Energy
Access



Introduction

The "Integrated Energy Systems" Continuing Professional Development (CPD) course is a comprehensive and dynamic program designed to equip professionals like you with a holistic understanding of the intricate facets of modern-day energy systems. The course has been developed by a team of content experts who possess considerable experience in their respective fields within the energy sector. In an era marked by rapid advancements and increasing complexity within the energy sector, this course serves as a navigational guide, exploring vital themes such as energy security, whole systems thinking, sustainability, and energy efficiency and management. As energy plays a pivotal role in shaping economies, environments, and societies, it is imperative for professionals to not only grasp individual components of the energy landscape but also to comprehend how these components interconnect and influence each other.

Throughout this course, you will delve into the strategic dimensions of energy security, delve into the concept of whole systems thinking and its application in energy contexts, explore sustainable practices that harmonize energy needs with environmental stewardship, and master the art of optimizing energy consumption through efficiency and effective management practices. Embark on this educational journey to elevate your expertise and empower yourself to contribute meaningfully to the energy challenges and opportunities of today and tomorrow.

Certificates will be awarded upon successful completion of the course.

The course is subsidized by UK aid from the UK government via the Transforming Energy Access platform.

Eligibility Requirements

The "Integrated Energy Systems" course is designed to cater to a diverse audience within the energy sector, offering an opportunity to deepen their understanding of integrated energy systems and enhance their professional skills. This course is particularly relevant for professionals who possess at least a national diploma (or its equivalent) in related fields and are actively involved in the energy sector. It is also beneficial for managers and decision-makers seeking insights into the complexities of integrated energy systems.

Furthermore, individuals with a technical background who are considering a transition into the energy sector can find substantial value in this course. Moreover, professionals looking to accrue Continuing Professional Development (CPD) points can leverage the comprehensive knowledge and practical insights provided by this program.

Whether you are engaged in energy production, distribution, policy-making, or management, this course offers a customized learning experience. It equips you with the tools and knowledge required to navigate the ever-evolving landscape of integrated energy systems effectively. Interested candidates must undergo an application process, which will be reviewed by a panel of assessors drawn from the University of Cape Town.

Technical Requirements

This course will take place online. You will **need to have access to a computer or laptop for this course as well as a stable internet connection and data**

Minimum/ Recommended requirements for a stable internet connection:

- Wireless: 4MB/s (unshaped & uncapped)
- ADSL: 8MB/s (unshaped & uncapped)
- Fibre: 5MB/s (unshaped & uncapped)
- Windows: Windows 8; Windows 8.1 or Windows 10 x86 (32-bit) and x64 (64-bit)
- Apple: macOS 10.10; macOS 10.11; macOS 10.12; macOS 10.13; macOS 10.15 or macOS 10.15

Format and Delivery

The "Integrated Energy Systems" course spans 8 weeks and encompasses 4 distinct modules, each meticulously designed to provide a comprehensive learning experience. The structure is thoughtfully tailored: every 2 weeks, a new module's lessons and assignments will be unveiled, ensuring a steady progression of knowledge and skills. The course is conducted entirely in English, fostering a globally accessible learning environment. An essential component is the culmination in a final project, allowing participants to showcase their mastery of the taught concepts. Moreover, the program is delivered through a flexible remote learning platform. This enables students to download lessons and materials, affording the convenience to engage with the content at their own pace and convenience, and at a time when they are feeling the most productive and focused to ensure maximum efficiency of the course delivery. This format ensures that professionals with diverse schedules and commitments can engage deeply with the course material, empowering them to derive maximum value from this educational journey.

Course Description

Module 1 – Energy Security

In this module, participants can gain a comprehensive understanding of the intricate dynamics surrounding the availability, reliability, and resilience of energy sources. This module delves into the critical aspects of energy supply, addressing both domestic and global perspectives. Participants will explore the vulnerabilities and risks associated with various energy resources, ranging from fossil fuels to renewable sources, and the geopolitical implications that arise from energy dependencies. Through this module, learners will analyze strategies aimed at mitigating potential disruptions, such as diversification of energy portfolios, investment in innovative technologies, and international cooperation. Additionally, participants will examine the economic, environmental, and societal factors shaping energy security policies, ensuring a well-rounded comprehension of the multifaceted challenges and solutions within the energy domain. By the module's end, participants will be equipped to assess, strategize, and contribute to discussions surrounding the complex landscape of energy security.

Module 2 – Whole Systems Thinking

Participants will delve into a comprehensive exploration of energy systems from a holistic perspective. This module offers a unique opportunity to understand the intricate interplay between various components within energy ecosystems. Participants will learn to view energy generation, distribution, consumption, and environmental impacts as interconnected elements that collectively shape the energy landscape. Through real-world case studies and simulations, learners will uncover the ripple effects of decisions made

within one part of the energy system on other components. The module will highlight the significance of considering environmental, social, and economic factors when designing and optimizing energy systems. By the module's completion, participants will have acquired the skills to analyze complex energy systems, identify leverage points for positive change, and formulate innovative solutions that account for the interconnected nature of the energy sector.

Module 3 - Sustainability

In the "Energy Sustainability" module, participants will delve into the crucial principles and practices that underpin the long-term viability of energy systems. This module provides a comprehensive understanding of the intricate balance between meeting current energy demands and safeguarding future generations' needs. Learners will explore renewable energy sources, energy efficiency measures, and the integration of sustainable technologies to minimize environmental impacts. Through real-world case studies and assessments of energy policies, participants will analyze the economic, social, and environmental dimensions of energy sustainability. By the end of the module, participants will have gained the knowledge and tools to evaluate energy projects' ecological footprint, advocate for responsible energy practices, and contribute to the global pursuit of a more sustainable energy future.

Module 4 – Energy Efficiency and Energy Management

In this module, participants will acquire a comprehensive understanding of strategies and techniques aimed at optimizing energy utilization across various sectors. This module offers insights into identifying inefficiencies, reducing wastage, and enhancing overall energy performance in residential, commercial, and industrial settings. Learners will delve into energy auditing, assessing equipment efficiency, and implementing smart technologies to monitor and control energy consumption. Through hands-on exercises and case studies, participants will learn how to design and implement effective energy management plans, considering factors like cost-effectiveness, environmental impact, and regulatory compliance. By the module's completion, participants will be equipped to contribute significantly to energy conservation efforts, lower operational costs, and enhance sustainability across diverse energy-intensive environments.

Overview

Course	Integrated Energy Systems
Dates	8 weeks, starting 7 July 2025 Registration deadline: 30 June 2025
Modules and Duration	Energy Security: 2 weeks, 10 hours/week Whole systems thinking: 2 weeks, 10 hours/week Sustainability: 2 weeks, 10 hours/week Energy Efficiency and Energy Management: 2 weeks, 10 hours/week
Venue	Vula EMS Online Platform
Fees	This course is subsidized by <i>UKAid</i> from the UK government via the <i>Transforming Energy Access</i> platform Standard fee: R2100 for the full course

Registration

Please read the following carefully to follow the registration process.

Registration and Cancellation

- Potential candidates interested in participating in this course, should check the eligibility and technical requirements on pg 2 and 3 of this document. If you fulfil these requirements, the registration form can be found [here](#). All applications will be considered, and successful candidates will be informed via email within a week of submitting their registration form.
- The registration fee covers all aspects of the course, there are no additional costs.
- Registrations close two weeks before the start of the course. Confirmation of successful enrolment will be sent by email.
- **Cancellations must be received no less than one week before the start of a course, or the full course fee will be charged.**

Certificates

A digital certificate of completion will be awarded to participants who achieve a minimum pass rate of 50% required for all assignments and tests. For further information on digital certificates please visit [Digital Certificates at UCT](#)

Contact Details

For more information or details on this course:

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