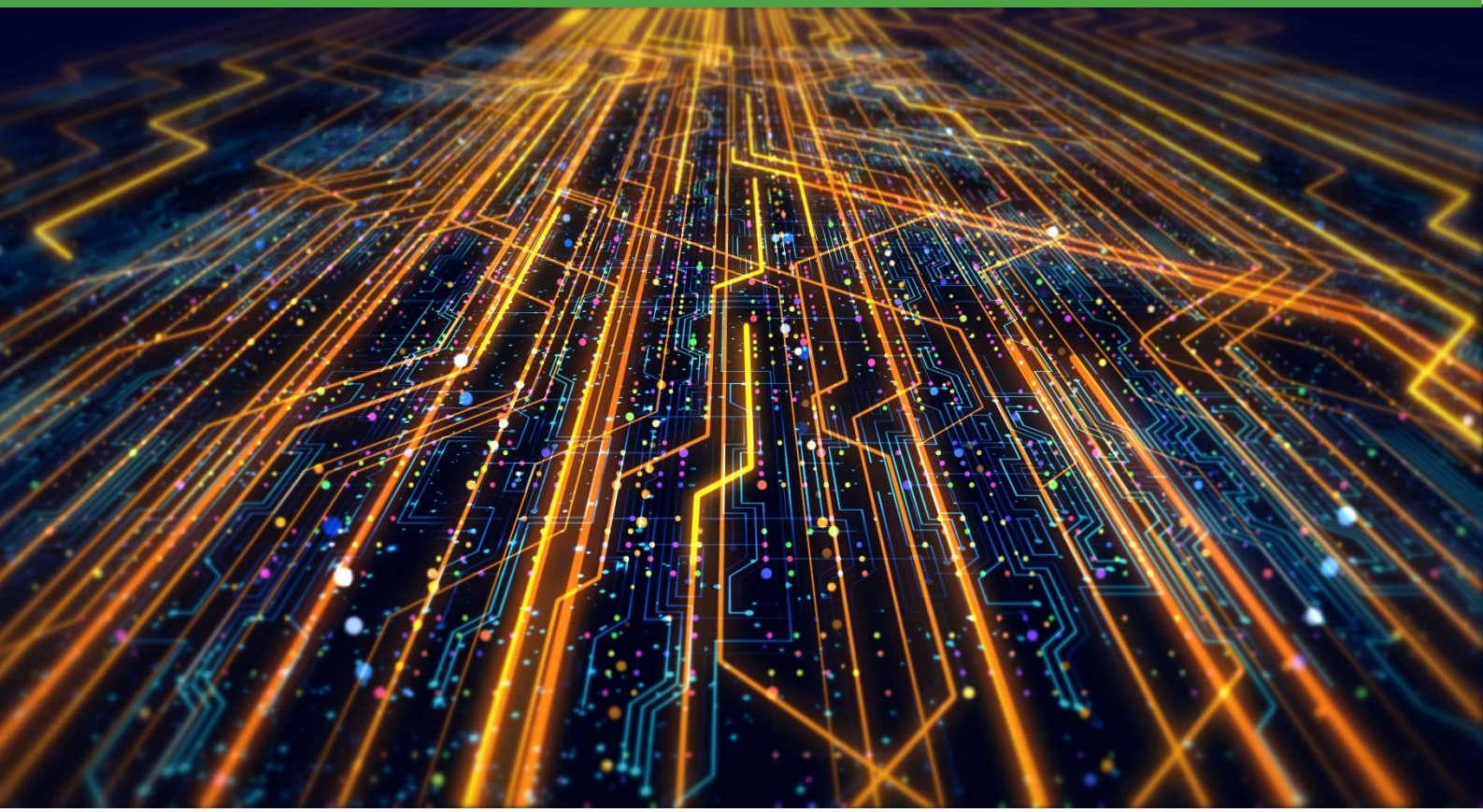
FACULTY OF
ENGINEERING &
THE BUILT ENVIRONMENT

CPD
CONTINUING PROFESSIONAL DEVELOPMENT



Integrated Data Energy Analytics

8 weeks online, start dates:
IDEA5 - 19 Jan 2026
IDEA6 - 20 April 2026
IDEA7 – 20 July 2026
IDEA8 – 19 Oct 2026

UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

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Introduction

Welcome to the *Integrated Data & Energy Analytics* (IDEA) Continuing Professional Development (CPD) course – a gateway to an exciting learning journey where the realms of data analytics and energy systems converge. In an era where the energy landscape is dynamically evolving, this course is designed to equip professionals with a deep understanding of the intricate interplay between data and energy.

Delving into the comprehensive range of topics, our CPD course offers a deep exploration into understanding and managing demand, through exploring topics such as "Demand Assessment and Forecasting Techniques, End User Consumption Behaviour, and Data Analytics for Operational Performance Evaluation,". The course goes beyond the surface level and unravels the complexities of analysing end-user consumption behaviour and harnessing the power of data analytics for robust operational performance evaluation.

Embark on this exciting learning journey that not only expands your expertise in energy analytics but also prepares you to navigate the challenges and opportunities presented by the synergy between integrated data and energy systems. Welcome to a course where knowledge meets innovation, and where each module is a step towards becoming a proficient professional in the dynamic landscape of data and energy.

Certificates will be awarded upon successful completion of the course. Participants who successfully complete the course will also be awarded 8 CPD credits from the Engineering Council of South Africa (ECSA).

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

Eligibility Requirements

The *Integrated Data & Energy Analytics* course is designed to cater to a diverse audience within the energy sector, offering an opportunity to deepen their understanding of Data Analytics 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.

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.

Prospective candidates interested in enrolling in the course must undergo an application process. The applications will be thoroughly reviewed by a panel of assessors drawn from the University of Cape Town. This ensures that participants admitted to the program are well-suited to the course's objectives and can contribute effectively to the learning community.

Whether you are looking to enhance your expertise, transition into the energy sector, or accrue CPD points, the "Integrated Data & Energy Analytics" course provides a tailored learning experience to meet your professional aspirations within the dynamic landscape of Data Analytics in the energy domain.

Technical Requirements

This course will take place online in a virtual, asynchronous environment. 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 Data & Energy Analytics" course spans 8 weeks and encompasses 8 distinct modules, each meticulously designed to provide a comprehensive learning experience. The structure is thoughtfully tailored: every week, 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. 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 – Introduction to Demand Assessment and Forecasting

Recognizing the pivotal role of demand assessment and forecasting across diverse industries is paramount for effective business planning and resource allocation. This involves delving into various demand patterns such as seasonality, trends, and irregular variations, which significantly influence market dynamics. Seasonal fluctuations, long-term trends, and unpredictable irregularities all contribute to the complexity of demand forecasting. To navigate this complexity, an introduction to statistical and machine learning techniques becomes crucial. Employing these advanced analytical tools enables businesses to derive meaningful insights from historical data, identify patterns, and make informed predictions. By understanding and harnessing the power of demand forecasting methodologies, industries can optimize their operations, manage inventory efficiently, and stay responsive to dynamic market changes.

Module 2 – Data Collection and Pre-processing for Demand Forecasting

Efficient demand forecasting relies heavily on the meticulous collection, cleaning, and organization of relevant data. The initial step involves adopting diverse methods to gather pertinent data, ensuring a comprehensive representation of factors influencing demand. Subsequently, the focus shifts to the crucial tasks of cleaning, transforming, and organizing the data. This process is indispensable for enhancing the accuracy of forecasting models by eliminating inconsistencies and irrelevant information. Dealing with missing data and outliers is a critical aspect of this data refinement, as these anomalies can significantly impact the integrity of predictions. A thorough approach to data management not only strengthens the foundation for accurate demand forecasting but also contributes to the reliability of decision-making processes within businesses.

Module 3 – End User Consumption Behaviour

Understanding consumption behaviour is pivotal in shaping effective marketing strategies and business decisions. Various factors, including socio-economic status, cultural influences, and individual preferences, play a significant role in shaping how consumers make choices. Segmentation of consumers based on behaviour and preferences allows businesses to tailor their approaches, addressing specific needs and desires within distinct target groups. Case studies provide valuable insights into analysing consumption patterns and trends, offering real-world examples of successful strategies or highlighting potential pitfalls. By delving into these aspects, businesses can gain a deeper understanding of their target audience, refine their marketing tactics, and ultimately foster more meaningful connections with consumers.

Module 4 – Forecasting Techniques

Time series analysis is a critical component of demand forecasting, involving methods such as moving averages and exponential smoothing. These techniques allow for the identification of patterns and trends within historical data, aiding in accurate predictions of future demand. Additionally, regression analysis plays a crucial role in demand forecasting by examining the relationship between dependent and independent variables. This method helps quantify the impact of various factors on demand, contributing to a more comprehensive understanding of market dynamics. Furthermore, the application of machine learning algorithms adds a sophisticated dimension to demand prediction, enabling businesses to leverage advanced models for enhanced accuracy and adaptability in forecasting future demand patterns.

Module 5 – Data Analytics for Operational Performance Evaluation

Data analytics plays a crucial role in evaluating operational performance across various industries. By harnessing the power of data, businesses can quantify and analyse their efficiency, identifying areas for improvement and optimization. Key performance indicators (KPIs) tailored to specific industries and sectors serve as measurable benchmarks, providing a standardized framework for assessing success and addressing operational challenges. Visualizing and interpreting operational data through dashboards and reports enhance decision-making processes by presenting complex information in a comprehensible format. This not only facilitates a deeper understanding of performance metrics but also empowers organizations to make informed strategic decisions, fostering continuous improvement in their operational endeavours.

Module 6 – Data Driven Decision Making

Leveraging data insights has become a cornerstone for making informed business decisions in today's dynamic landscape. By analysing data, organizations can uncover valuable patterns and trends, enabling them to identify opportunities for efficiency improvement and cost reduction. This data-driven approach goes beyond traditional decision-making methods, allowing businesses to base their strategies on concrete evidence rather than intuition alone. Incorporating data-driven decision-making into organizational processes establishes a proactive and adaptive framework, ensuring that choices align with both current market conditions and long-term objectives. Ultimately, this integration of data-driven decision-making empowers businesses to stay agile, responsive, and competitive in an ever-evolving business environment.

Module 7 – Future Trends and advanced Topics

Staying at the forefront of business dynamics involves exploring emerging trends in demand forecasting, consumption behaviour analysis, and data analytics. With the rapid evolution of technology, businesses are delving into advanced topics such as predictive analytics, prescriptive analytics, and machine learning for optimization. Predictive analytics enables organizations to anticipate future trends and behaviours, offering a proactive approach to decision-making. Meanwhile, prescriptive analytics goes a step further by providing actionable insights and recommendations to optimize outcomes. The integration of machine learning further enhances the precision and adaptability of analytics processes. By embracing these advanced concepts, businesses can not only enhance their forecasting accuracy but also uncover valuable insights that drive strategic decision-making and foster continuous improvement.

Module 8 – Ethical and Privacy considerations

Engaging in a thoughtful exploration of ethical considerations is paramount when working with consumer data. As businesses increasingly rely on data-driven insights, the responsibility to ensure data privacy and compliance with regulations becomes crucial. Respecting and safeguarding the confidentiality of consumer information is not only an ethical imperative but also a legal requirement in many jurisdictions. Striking a balance between utilizing data for strategic purposes and protecting individual privacy is essential. By establishing robust policies and practices, businesses can build trust with consumers, adhere to regulatory frameworks, and navigate the ethical dimensions of handling sensitive data responsibly. This commitment to ethical standards ultimately strengthens the integrity of data-driven decision-making processes.

Outcomes

Upon completion of this course, participants will gain a diverse set of skills.

- analytical skills, including the interpretation of historical data and the application of forecasting techniques such as time series analysis and regression analysis.
- statistical and machine learning knowledge to derive meaningful insights, identify trends, and make accurate predictions.
- efficient data management, cleaning, and organization, addressing issues like missing data and outliers.
- market segmentation and case study analysis to tailor marketing strategies and understand consumption patterns.
- data visualization for informed decision-making, fostering adaptability and proactivity in a dynamic environment.

Overview

Course Title	*Integrated Data Energy Analytics*
Dates	8 weeks, starting 19 January, 20 April, 20 July, 19 October 2026 Registration deadline is one week before course starts.
Modules *Each module runs over 1 week and requires approximately 10 hours of your time	Module 1 – Introduction to Demand Assessment and Forecasting Module 2 – Data Collection and Pre-processing for DemandForecasting Module 3 – End User Consumption Behaviour Module 4 – Forecasting Techniques Module 5 – Data Analytics for Operational Performance Evaluation Module 6 – Data Driven Decision Making Module 7 – Future Trends and advanced Topics Module 8 – Ethical and Privacy considerations
Venue	Vula EMS Online Platform
Fees	Standard fee: R2100 for the full course This course is partially subsidized by UKAid from the UK government via the Transforming Energy Access platform.

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:

Web: www.cpd.uct.ac.za Email: ebe-cpd@uct.ac.za

Physical Address

CPD Programme
Room 6.10, 6th Floor
New Engineering Building
Upper Campus
University of Cape Town
South Africa

Postal Address

CPD Programme EBE
Faculty
University of Cape Town
Private Bag X3 Rondebosch
7701
South Africa

Contact Details

Mascha Moorlach:
Tel: +27 72 2405174
Email: mascha.moorlach@uct.ac.za

Heidi Tait:
Tel: +27 21 650 4922
Email: heidi.tait@uct.ac.za