



澳門科技大學

MACAU UNIVERSITY OF SCIENCE AND TECHNOLOGY

持續教育學院

School of Continuing Studies

本課程已納入
教青局
持續進修發展計劃

註：此課程已獲「建築
、工程及城市規劃專業
委員會」(電機工程、機
電工程專業範疇)認可
時數 14 小時。

能源工程(光伏系統)課程

Energy Engineering Course for Solar PV System

課程簡介 Course Introduction

課程的宗旨是加深機電建築專業人士在能源光伏技術知識。課程將涵蓋介紹和分析薄膜這一領先技術以及產品性能，課程中將會介紹薄膜產品的安裝技術方面及測試量度、評估能源方案達至能源效益、有效經濟效益。

The course is specially designed for those who want to widen and deepen their knowledge with the fundamental principles, skills and guidelines needed to carry out solar PV Panel System and Installation in accordance with Feed in Tariff (FiT) Scheme at Hong Kong by CLP & HEC Power Companies at 2018. After taking the course, the participants would appreciate the approach to know more about solar PV system design and installation and renewable energy measures and perform quantitative analysis to predict the energy savings, environmental and economic benefits. Moreover, the participants should be able to testing and commissioning of the solar PV System and verify the performance of each type solar panel installation method and case analysis of PV projects.

課程大綱 Course Outlines

課堂一：

- 太陽能設計、安裝並網系統及流程簡介 Introduction to the Grid-connected PV installation and Safety issue
 - 簡介太陽能系統 Brief Introduction of Solar Photovoltaics System
 - 太陽能系統上網電價 Feed-in Tariff
 - 太陽能系統設計、安裝及申請並網流程 Solar System Design, Installation & On-grid Application
 - 更多安全建議 More safety measures
- Solar PV Technology & Hybrid Energy
 - Hybrid Microgrid Design and Development
 - Integrated Controls & Energy Storage
 - Solar PV Technology – Energy
 - Integrating Solar PV and Energy Storage & Hybrid Energy System

課堂二：

- Technical features, installation and systems design on PV grid-connected Microinverter
 - What kind of challenges you may face when build rooftop PV systems?
 - How to use microinverter to do the solar systems design and install the module-level system monitoring?
 - How to use microinverter to build up your own competitive advantages in the market?
- 微逆系統及 AP systems 產品介紹概覽 - Multi-platform MLPE (Module Level Power Electronics) Technology
 - 微型逆變器優勢，逆變器類型，參數配置
 - 系統的優勢應用，輔料和交流匯流排電纜結構

- 微逆系統設計、安裝、調試及案例分析和節能成效的測量和核證方法
 - 系統總覽
 - 設計資訊採集
 - 逆變器選型
 - 組件選型
 - 逆變器排布圖
 - 系統原理圖
 - 系統組態清單
 - 安裝
 - 調試
 - 案例分析
- EMA (Energy Monitoring & Analysis) and ECU (Energy Communication Unit) 監控平台
 - 監控軟體概覽
 - EMA APP 監控頁面
 - EMA 操作演示
- Case Analysis of EMEA & USA Projects
 - Case Study of Solar PV System using Microinverters at USA Projects
 - Video Shows for Solar PV System using Microinverters
- 常見問題及解答- ECU 問題
 - 微型逆變器問題
 - 組件問題
 - 系統發電異常問題

教學對象 Target Audience

執業機電工程師及建築屋宇裝備專業人士 E & M Engineers and Building Services professionals

授課語言 Medium of Instruction

以廣東話講授，筆記以英文為主 Delivered in Cantonese with notes mainly in English

報名地點 Venue for Enrollment

澳門氹仔偉龍馬路澳門科技大學 O 座 2 樓 持續教育學院

SCS, 2/F Block O, Macau University of Science and Technology, Avenida Wai Long, Taipa, Macau

上課地點 Venue for Class

澳門氹仔偉龍馬路澳門科技大學（確實地點將於確認開課時以手機短訊通知）

Macau University of Science and Technology, Avenida Wai Long, Taipa, Macau

上課日期 Course Date & Time

課程編號 Course code : 1904250189-0	12 & 19 Oct 2019	週六 Sat 10:00-13:00 14:00-18:00	總課時 14 小時 Total 14 hours
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課程費用 Tuition Fee MOP2,800

收生名額 Class Size 30

* 報名注意事項 Enrollment Notes *

報名時間：星期一至五(9:00 - 20:00)、星期六(9:00 - 13:00) [公眾假期除外]

Operation hours: Monday to Friday (9:00 – 20:00) ; Saturday (9:00 - 13:00) [Close at Public Holidays]

1. 首次報讀本院短期課程者，請先登入網上報名系統（網址：<https://scs.must.edu.mo/oasc/PersonalInfo.do>）或掃描以下的 QR Code，選擇 **工程學和工程行業** 類別，預先登記個人資料（不需上傳身份證），填妥資料後，帶備身份證正、副本及相片 1 張至本院辦理報名。

For those who enroll for our courses for the first time, please go to <https://scs.must.edu.mo/oasc/PersonalInfo.do> or scan the QR Code below, choose the category of **<Engineering>**, and input personal information (no need to upload ID copy). After registration online successfully, please come to our school to make payment. You should bring along with your ID card and copy, and a passport size photo.

2. 報讀者可以現金/本票或劃線支票（抬頭請寫“澳門科技大學持續教育學院”或“SCHOOL OF CONTINUING STUDIES MACAU UNIV. OF SCIENCE AND TECHNOLOGY”）繳付學費及材料費，現金收費上限為澳門幣/港幣 5,000 元。

Tuition fee and materials fee (if any) should be paid by cash or by cheque/Cashier Order (Please make payable to “SCHOOL OF CONTINUING STUDIES MACAU UNIV. OF SCIENCE AND TECHNOLOGY”). **Cash is accepted for payment of not more than MOP5,000.**

3. 所有費用一經繳交，恕不退還（本院取消開辦該課程除外）或轉讓。

All payment made is not refundable (except that the course is cancelled by the School) or transferable.

4. 如課程報名人數不足，本院保留課程取消或延期的權利。

The School reserves the right to cancel or postpone the courses if minimum class size is not reached.



查詢 Enquiries

Tel: 8796 1998 Email: scs@must.edu.mo

Website: <http://www.must.edu.mo/scs/diploma-certificate-programs>

持續教育學院致力開拓終身學習機會，如欲收到本學院之課程資料，可發電郵至 scs@must.edu.mo，並提供閣下之電郵地址，標題主旨為“加入通知群組”。

The School of Continuing Studies develops life-long learning opportunities. Should you wish to receive information on our programs / courses, please send us an email (to scs@must.edu.mo) stating your email address in your email and “Join the mailing list” in the Subject line.

我們亦為機構/政府部門/學校等提供內部培訓，按各機構不同之要求(主題/時間/地點/對象)而訂定培訓內容。請與我們聯絡。

We also offer in-house training for corporations/Government Departments/schools, tailor-made with respect to your choices of topics, time, place, and group of attendees. Please contact us for more information.