

瑞士微型傳感器及零部件 – 生產技術及應用海外培訓課程
Overseas Training Course to Switzerland on Micro Fabrication & Advanced Micro-sensors Manufacturing Process and Applications
13-19 March 2016

傳感器是許多高附加值產品的重要組成部分。隨着市場對微型化和高附加值的電子、電器、汽車和醫療設備的需求不斷增長，微型傳感器市場亦隨之迅速增長。基於微機電系統（MEMS）技術，高精度微型傳感器的發展趨向多元化。

大部分香港及珠三角地區的製造商開始將不同類型的 MEMS 傳感器和零部件用於其高附加值的產品。然而，他們一直面對著設計靈活性的挑戰。因此，本地廠商必須更深入了解 MEMS 傳感器的技術、製造及測試所需的技術及設施，以更有效地運用這些傳感器組件，從而降低產品生產成本，並利用各種潛在的新型傳感器，擴大產品的應用範圍。



Sensors act as critical components of many high-value products. With the growing demand of the miniaturized and high-value added electronic, electrical, automotive and medical devices, the market of micro-sensors has been increased rapidly in recent years. Based on the Micro-Electro-Mechanical Systems (MEMS) technology, a diverse range of high-precision micro-sensors can be developed with attractive benefits.

Most of the manufacturers in Hong Kong and Pearl Delta Region started adopting different types of MEMS sensors and components in their high-value added products. However, they have been suffering from challenges in design flexibility. Therefore, it is necessary for local manufacturers to establish ways of acquiring the relevant MEMS technology so as to reduce the costs of productions and to exploit various opportunities to expand the potential product ranges.

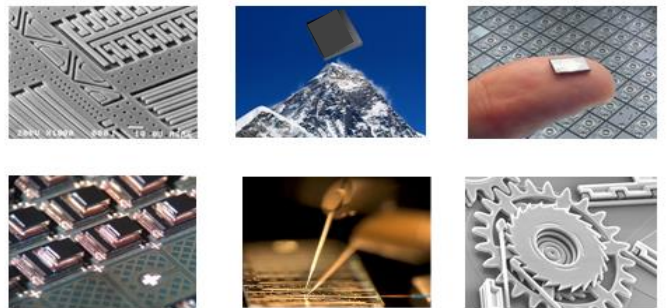
本培訓課在獲取最新歐洲-瑞士 MEMS 傳感器技術，讓參加者深入了解 MEMS 傳感器/設備的設計和製造原則和要求、關鍵生產和檢測技術、MEMS 傳感器的整合、新興 MEMS 傳感器零部件在不同高附加值產品的應用。

The training course aims at acquiring the latest MEMS sensor technology in Europe (Switzerland) and providing an in-depth understanding in the topics in the MEMS sensor/device design and fabrication principles and requirement, critical manufacturing, testing technologies and integration of MEMS sensor products and the emerging applications of MEMS sensors and components.

課程對象 Target Participants

歡迎從事微型傳感器相關人士（如醫療及保健設備、汽車零部件、電子、電器、消費類產品、樓宇及建造等）參加，其中包括：管理人員、專業人士、技術主任、工程師、技術顧問、產品設計經理、研發人員及技師等。

Management executives, professionals, technical officers, engineers, technologists, product development managers, R&D and technicians, from the micro-sensor related industries, such as medical and healthcare device, automotive parts, electronic, electrical and 3C products, building and construction, and etc.



本課程已獲職業訓練局新科技培訓計劃(NTTS)預先批核。每位合資格參加者(須為香港永久居民)可申請培訓津貼最高為 50% 實際課程費用，

最多為港幣 11,210 元正,名額 12 人。

主辦機構
Organizer :



支持機構
Supporting Organization:



行程 Programme

日期 Date	行程 (Programme)
3月13日(日) 13 Mar (SUN)	由香港出發到瑞士 Depart from Hong Kong to Switzerland
	抵達瑞士 Arrive Switzerland
3月14日(一) 14 Mar (MON)	培訓 1: - 概論互補式金屬氧化物半導體(CMOS)微芯片/傳感器的技術和應用 Training 1: - Introduction to the technology of Complementary Metal-Oxide-Semiconductor (CMOS) micro-chip/sensor and applications
3月15日(二) 15 Mar (TUE)	培訓 2: - 介紹微製造工藝和設備 - 無塵室培訓工作坊, 包括設備以及傳感器製造過程 (含實踐課) Training 2: - Introduction to the micro-fabrication processes and the facilities - Training Workshop in cleanroom including equipment and sensor manufacturing process (with practical sessions)
3月16日(三) 16 Mar (WED)	培訓 3: - 介紹整個微機電系統和微型傳感器的技術發展和製作過程 - 微機電系統和微型傳感器的微/納米製造和生產流程 - 微機電系統的機械或技術示範和實踐課 Training 3: - Introduction to the technical development and productions of MEMS and Micro-sensor - Production Processes of MEMS and Micro-sensor - Machinery or technology demonstration on MEMS technology and practical sessions
3月17日(四) 17 Mar (THU)	培訓 4: 實例分析 (微機電系統和微型傳感器的技術, 以及應用在不同行業上的實例) Training 4: Case studies (MEMS and Micro-sensor technology and applications different industries)
3月18日(五) 18 Mar (FRI)	離開瑞士 Depart from Switzerland to Hong Kong
3月19日(六) 19 Mar (SAT)	抵達香港 Arrive Hong Kong

本局保留更改培訓內容、地點及時間的權利。

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主辦機構
Organizer



支持機構
Supporting Organization:



課程大綱 Training Content

培訓 1：概論互補式金屬氧化物半導體(CMOS)微芯片的技術

Training 1: Introduction to the technology of Complementary Metal-Oxide-Semiconductor (CMOS) micro-chip

- 概論互補式金屬氧化物半導體(CMOS)微芯片/傳感器的技術
- 概論基於互補式金屬氧化物半導體技術的傳感器和應用，包括：溫度傳感器·濕度傳感器·氣體流量傳感器·氣體和壓力傳感器等的質量流量控制器(設計方法及原理·製造工藝簡要說明和性能評估)
- Introduction to the technology of Complementary Metal-Oxide-Semiconductor (CMOS) micro-chip/sensors
- Introduction to different sensors based on the CMOS Technology and the applications including: temperature sensor, humidity sensor, gas flow sensor, mass flow controller for gases and pressure sensor etc. (Design considerations and principle, brief description of fabrication processes for this device and packaging)

培訓 2：介紹微製造工藝和設備

Training 2: Introduction to the micro-fabrication processes and the facilities

- 介紹微製造工藝和設備
- 無塵室培訓工作坊，包括設備以及傳感器製造過程(含實踐課)
- Introduction to thin-film deposition techniques, Photolithography and nano-patterning, Wet and dry etching techniques, surface micromachining, bulk micromachining, deep silicon micromachining, nano-machining, focus ion beam milling, micro-molding, nano-imprinting, nano-embossing, wafer bonding, wafer-level packaging
- Training Workshop in cleanroom including equipment and sensor manufacturing process (with practical sessions)

培訓 3：介紹整個微機電系統和微型傳感器的技術發展和製作過程

Training 3: Introduction to the technical development and productions of MEMS and Micro-sensor

- 介紹整個微機電系統和微型傳感器的技術發展和製作過程
- 微機電系統和微型傳感器的微/納米製造和生產流程
- 微機電系統的機械或技術示範
- Introduction to the technical development and productions of MEMS and Micro-sensor
- Production Processes of MEMS and Micro-sensor
- Machinery or technology demonstration on MEMS technology

培訓 4：實例分析(微機電系統和微型傳感器的技術·以及應用在不同行業上的實例)

Training 4: Case studies (MEMS and Micro-sensor technology and applications different industries)

- 微機電系統和微型傳感器的技術·並在醫療行業的應用
- 微機電系統和微型傳感器的技術·並在汽車行業的應用
- 光學微機電系統開關的技術，並在電信行業的應用
- 氣體傳感器/熱傳感器/氣味檢測器的技術以及應用

Training 4: Case studies

- MEMS and Micro-sensor technology and applications in medical industries
- MEMS and Micro-sensor technology and applications in automotive industries
- Optical MEMS switches in telecommunications
- The technology and applications of Gas sensor / Heat sensor / Smell sensor

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主辦機構
Organizer



支持機構
Supporting Organization:



香港汽車零部件工業協會
Hong Kong Auto Parts Industry Association



Hong Kong Critical Components
Manufacturers Association
香港關鍵性零部件製造業協會



香港表面處理學會
Hong Kong Surface
Finishing Society

詳情 Details

費用: 每位港幣 30,500 元正 (支持機構會員每位港幣 29,500 元正)

Fee for each participant : **HK\$30,500** (Member of supporting organizations: **HK\$29,500**)

費用包括: 香港往返瑞士經濟客位機票連機場稅及燃料附加費、四晚雙人房酒店住宿連早餐 (單人房須額外收費)、培訓教材及其他培訓雜費、行程內交通費用、基本意外保險【只適用於香港居民及隨團往返之參加者】。
The training fee includes round-trip economy class air tickets between Hong Kong and Switzerland (include airport tax, fuel and security charges), hotel for 4 nights (twin-room) with breakfast, training materials, local transportation in the itinerary, travel insurance (Only apply to Hong Kong Residents that depart and return with the group as planned)

不包括: 午餐、晚餐 (指定午餐或晚餐除外)、簽證費用、行程外之額外交通費用

The training fee is NOT inclusive of meals, visa, inland transportation that is not listed in the itinerary.

此海外培訓班之機票、交通、住宿及其他旅遊事宜將由持牌旅行社負責。

Air tickets, transportation, accommodation and other travel arrangements will be in charge by a licensed travel agency.

培訓機構 Training Institutions

CSEM, Swiss Center for Electronics and Micro-technology

- CSEM is a Swiss Research and Development center specializing in micro-technology, nanotechnology, microelectronics, system engineering, photo-voltaic and communications technologies. CSEM is able to offer its customers and partners a full solution including MEMS, ASIC, system integration, packaging, and testing, as well as training, all with the guarantee of the utmost reliability. CSEM also offers industry small-scale production of MEMS components as well as packaged microsystems.
- CSEM 是瑞士的研究和開發中心擁有專業顯微技術·納米技術·微電子·系統工程·光伏和通信技術· CSEM 能夠提供其客戶和合作夥伴提供完整的解決方案·包括 MEMS·ASIC·系統集成·封裝和測試·以及培訓·都保證能夠提供優質和優良的可靠性· CSEM 亦為業界提供小規模生產的 MEMS 組件·以及包裝·

Center of Micro-nanotechnology (CMI), EPFL

- To provide basic and advanced training on processes and technologies
提供有關流程和技術基礎和高級培訓
- To offer the processing equipment available in the clean room
提供無塵室的加工設備
- To cooperate with other academic institutions and research centers
與其他學術機構和研究中心開展合作

Sensirion AG

- Sensirion is a leading sensor manufacturer, providing relative humidity sensors and flow sensor solutions with unique performance. Together with the capacitive humidity sensor, the product range includes liquid flow sensors, mass flow meters, mass flow controllers and differential pressure sensors. Among a large variety of applications, the flow and humidity sensors are successfully used in the automotive and medical industry.
- 作為世界領先的傳感器製造商· Sensirion (盛思銳)推出獨具匠心的相對濕度傳感器和流量傳感器解決方案·產品系列包括電容式濕度傳感器·液體流量傳感器·氣體質量流量計·氣體質量流量控制器和差壓傳感器·目前流量和濕度傳感器已成功應用於汽車電子和醫療器械等諸多領域

Other MEMS / Micro-sensor manufacturers: (TBC)

主辦機構
Organizer



支持機構
Supporting Organization:



HKPC®

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香港九龍達之路78號生產力大樓 www.hkpc.org

General Terms and Conditions

This study mission (“Mission”) is subject to the following terms and conditions:

1. Acceptance

HKPC may in its absolute discretion accept or reject the Application without providing any reasons therefor.

2. Payment

- a) Upon submission of Application, the Applicant shall pay to HKPC the Participation Fee.
- b) If the Application is rejected, HKPC will refund to the Applicant without interest.
- c) When the Application is accepted by HKPC, the Applicant will become a Participant. If the Participant subsequently wishes to withdraw participation, he/she may do so by notice in writing to HKPC prior to the departure date of the Mission according to the number of days prescribed in the pamphlet for the Mission whereupon the Participation Fee may be refunded subject to the deduction of any costs already paid by HKPC which are otherwise unrecoverable through HKPC's service providers. An administration fee as prescribed in the pamphlet for the Mission will be charged to the Participant.
- d) The Participant shall settle the hotel directly all additional charges incurred by them at the hotel when they check out from the hotel.
- e) No interest will be payable by HKPC in respect of any refund amounts to the Participant.

3. Termination Policy

- a) Without prejudice to HKPC's other rights and remedies, HKPC has the right to terminate the Participant's right to participate in the Mission on the occurrence that the Participant violates any of the terms or requirements contained in these Conditions.
- b) The Participant's right to participate in the Mission shall automatically terminate in the event that all or most of the Participants are refused entry visa or entry permit to the country or place where the Mission shall be held by any competent authorities.
- c) In the event that the Participant's right to participate in the Mission is terminated, the Participation Fee will not be refunded to the Participant and any expenses incurred by HKPC for an on behalf of the Participant prior to such termination and all other expenses reasonably incurred by HKPC as a consequence of such termination shall be paid on demand by the Participant to HKPC.
- d) HKPC reserves the right to terminate the Participant's right to participate or continue to participate in any future Mission if the Participant is found to have committed any act including but not limited to failing to respect the intellectual property rights of any other party, non-compliance with product safety, environmental laws and/ or any other act which, in the sole opinion of HKPC, might damage the reputation and/ or image of Hong Kong, the industries, the Mission, HKPC, or the Participant has done or failed to do any act which HKPC, in its absolute discretion decides that such right shall be terminated.

4. Cancellation and/ or Changes

- a) HKPC reserves the right in any circumstances to cancel the Mission, for example because of an insufficient number of Participants or for whatever reason. If HKPC cancels the Mission, then save for an event set out in clause 4(e) below, HKPC's liability shall be limited to the amount of the fee actually paid by the Participant for that Mission.
- b) The dates and itinerary of the Mission may be subject to change without prior notice. HKPC reserves the right to use alternative accommodation, tours and transport to those stated in the Mission's promotional leaflets.
- c) Fees may be subject to changes, including without limitation surcharges, airfare, fuel or tax increases and currency fluctuations. HKPC reserves the right to charge Participants for all additional costs arising from such changes.
- d) Fees paid are not refundable on any unused part of the Mission or in the event that a Participant cancels participation in the Mission for any reason. Prior to the commencement of a Mission, HKPC may at its sole discretion accept a substitute nominated by the Participant to attend the Mission on his or her behalf, or accept request for change in departure/ return dates or transport arrangements, subject to the payment of any additional fees and charges that may be incurred by HKPC in agreeing to such a substitute or change.
- e) HKPC shall not be liable to any Participant for any delay, non-performance of services, loss or damage arising from any cause or causes beyond its reasonable control including, without limitation, any of the following: act of God, governmental act, war, terrorist attacks, fire, flood, earthquake, storm, tsunami, embargo, explosion or civil commotion. In such an event, HKPC reserves the right, at its sole discretion, to:
 - (i) postpone the Mission and/ or alter the dates and itinerary of the Mission as necessary without any refund due to the Participant; or
 - (ii) cancel the Mission and offer Participants a refund subject to the deduction of any costs already paid by HKPC which are otherwise unrecoverable through HKPC's service providers.

5. Exclusion of Liability

- a) HKPC shall not be liable for any loss, damage or personal injury howsoever suffered by or caused to the Participant or his/her officers, representatives, agents, employees or any third party, or other property in the course or in relation to the Mission, unless such loss, damage or personal injury shall be caused by any breach by HKPC.
- b) HKPC assumes no responsibilities for any introduction or transaction made between the Participant and any third party during or as a result of the Mission.
- c) The Participant shall be responsible for his/her own visa arrangements. In the event that a Participant is refused entry into any country on a Mission, HKPC shall not be liable for any loss of damage suffered.
- d) The Participant shall be responsible for effectuating all insurance coverage necessary in connection with his/her participation in the Mission including but not limited to insurance in respect of his/her other property and himself/herself (including travel and medical insurance).
- e) The Participant undertakes to indemnify and at all times hereafter to keep indemnified HKPC from an against all liabilities, actions, proceedings, claims, damages, costs and expenses whatsoever which he/she may suffer or incur by reason of or in relation to any act, omission or default by the Participant or his/her officers, representatives, agents and employees in the course of or in relation to the Mission.

6. General

- a) The Application Form and the Conditions embody and set out the entire agreement and understanding of the parties and supersede all prior oral or written agreements, understandings or arrangements between HKPC and the Applicant relating to the Mission.
- b) HKPC reserves the right to alter and amend any of these Conditions and to issue additional rules and regulations (including but not limited to the Participant's manual) at any time it considers necessary for the orderly operation of the Mission. The amended Conditions and the additional rules and regulations shall be sent to the Participant and become effective immediately. The Participant will be deemed to have notice of the same and have accepted the amended Conditions and the additional rules and regulations. The Participant acknowledges that HKPC shall have the right to interpret these Conditions, additional rules and regulations together any amendments thereof. All interpretations of these Conditions, any additional rules and regulations, and any amendments thereof by HKPC shall be final and binding on the Participants.
- c) These Conditions shall be governed by the laws of The Hong Kong Special Administrative Region only.

Letter of Intent

意向書

Please send the completed letter of intent to candycheng@hkpc.org for reservation.

Successful applicants will be notified by email.

Quota : 12.

Please complete this form in BLOCK LETTERS

Enquiry:

Mr Eric Yau

Tel: (+852) 2788 5507

Email: ericyau@hkpc.org

Ms Candy Cheng

Tel: (+852) 2788 6165

Email: candycheng@hkpc.org

Overseas Training Course to Switzerland on Micro Fabrication & Advanced Micro-sensors Manufacturing Process and Applications 13-19 March 2016

Name in English : (MUST be the same as shown in passport)		PHOTO
Name in Chinese : (Dr / Ir / Mr / Mrs / Ms *)		
Position :		
Company Name :		
Company address :		
Tel : (Office)		Tel : (Mobile)
Email address :		
Passport number :	Programme fee ** :	
Passport type** :	<input type="checkbox"/> Normal price: HK\$30,500	
<input type="checkbox"/> HKSAR Passport	<input type="checkbox"/> Discounted price: HK\$29,500, please specify:	
<input type="checkbox"/> Others, please specify:	<input type="checkbox"/> HKAPIA	<input type="checkbox"/> HKSFS
	<input type="checkbox"/> HKCCMA	<input type="checkbox"/> HKSTP
	Membership ID No.: _____	
Special arrangement (if any) For example, earlier flight back or stay behind / upgrading to business class / special meal arrangement (e.g. vegetarian food)		

*Delete whichever inappropriate

**Please put a "✓" in the box as appropriate

Declaration :

- I agree that the information provided above, will be used to process my application to participate in the overseas training course, such information may be provided to the local and national agencies, institutions or other relevant organizers.
 - I declare that all information provided in this enrolment form and the accompanying documents are, to the best of my knowledge, true, accurate and complete. **I have read and accepted** all the terms and conditions of this study mission.
- I object to the proposed use of my personal data including, without limitation, name, age, gender, phone number, fax number, job title, member status, payment details including credit card information (where applicable), academic and professional qualification, correspondence address and email address ("Personal Data") for the purpose of sending me information relating to HKPC's latest developments, industry support services, consultancy services, training courses and related events, and other marketing activities as may be organized by HKPC. Please put a "✓" in the box as appropriate.

Signature of applicant : _____

Date: _____

IMPORTANT NOTE:

- Personal Data collected will be used for processing your application for admission, registration, academic, administrative, research and statistical purposes and will also be used for marketing purposes, specifically for the purpose of sending you information relating to HKPC's latest developments, industry support services, consultancy services, events and training courses. Personal Data will be treated in strict confidence. Unless otherwise agreed by you, Personal Data will not be transferred to any third parties. HKPC implements a policy governing the collection, use and retention of Personal Data, which is made available at the enrolment counter. You may also contact Personal Data Controlling Officer of HKPC for further details.
- The dates and itinerary of the course may be subject to change without prior notice. HKPC reserves the right to use alternative accommodation, tours and transport to those stated in the course's promotional leaflets.
- Applicants are encouraged to pay by cheques, if possible, amount received will be imprinted. Cheques are subject to bank clearance.
- Programme fee (in full or in part) is not refundable except if HKPC is notified in writing of your withdrawal at least 30 working days before the study mission commences. A handling charge of HK\$2,000 will also be levied.
- HKPC reserves the right to reject any application in any circumstances and for whatever reasons. Payment of fees should only be construed as conditional acceptance of application.