中文 系統晶片應用簡介____

英文 Introduction to System-on-Chip and its Applications_____

課程說明：

This course introduces what is System-on-Chip (SoC), benefits of using SoC, system architecture, design methodology and its applications. It uses several SoC designs, such as computer chip sets, cell phone IC, multimedia ICs, wireless communication ICs, information appliances and interface ICs, as examples to illustrate the top-down IC design flow, Intellectual Property(IP), system platform design and their market applications. The computer chip sets covers personal computer architectures, memory and peripheral I/O interface chip design. The cell phone IC covers heterogeneous multi-processor (HMP). The wireless communication includes CDMA, OFDM and LTE, 4G and 5G chip designs. The multimedia ICs covers audio, still image, and video, AR/VR ICs. The biomedical ICs covers Gene chip, Lab on a chip, and Ink-jet microarray. Emerging applications related SoC include autonomous vehicles, high resolution display, Internet of Things (IoT), 3D sensing, and deep learning accelerators.

課程內容：

(一）SoC 簡介

1. SoC_MBA_Intro_to_SoC_1_0.ppt
2. SoC architecture and platform

（二）電腦系統晶片及應用簡介

2. 電腦系統晶片與應用簡介_1_0.ppt

（三）Memory 應用簡介

1. SRAM
2. DRAM
3. Flash memory

（四）Display technologies

1. LCD
2. LED

（五）通訊系統晶片及應用簡介

5 SoC_MBA_Wireless_Communication_1_0.ppt

5.1 SoC_MBA_CDMA_1_0.ppt

5.2 SoC_MBA_OFDM_1_0.ppt

5.3 Communication card

5.4 LTE

5.5 5G

（六）多媒體系統晶片及應用簡介

6 多媒體晶片系統及應用簡介_1_0.ppt

6.1 深入 3D 繪圖_1_0.ppt

6.2 深入音訊媒體_1_0.ppt

6.3 深入音訊媒體_DAB_1_0.ppt

6.4 深入虛擬實景成像_1_0.ppt

6.5 深入視訊媒體_1_0.ppt

6.6 深入視訊媒體_DVB_1_0.ppt

6.7 深入語音媒體_1_0.ppt

6.8 深入影像媒體_1_0.ppt

6.8 Virtual Reality (VR) or Augmented Reality (AR)

（七）Interface 應用系統

7.1 Bluetooth

7.2 RFID (Radio Frequency Identification)

7.3 USB (Universal Serial Bus)

7.4 NFC (Near Field Communication)

7.5 PCI (Peripheral Component Interconnect) computer

（八）應用系統

8.1 Social Network

8.2 Apps on mobile or Tablet devices

8.3 Wearable devices

8.4 Internet of Things

（九）辨識應用系統

9.1 autonomous vehicles,

9.2 Biometric Recognition System (fingerprint, iris, face, gait, etc)

9.3 AR/VR

9.4 3D sensing

9.5 Deep learning accelerators.

擬用教科書或參考書：

Lecture notes and ppt.

教科書：Michael J. Flynn and Wayne Luk, Computer System Design: System-on-Chip, Wiley, 2011.

Individual Projects:

Each student selects a topic from provided System_on_chip technologies list, provides 深入的核心技術，及市場產業進行分析，then give a presentation and a written report.

期末專題：

期初將先進行分組。

學生的期末專題題目及執行規劃將於期中考過後由學生於課堂上提出，針對課程介紹的系統晶片進一步探討，提出創新性應用的系統晶片,可著重進階的理論研究或深入的核心技術，亦可挑選市場產業進行分析。並由授課老師同意之後開始執行，專題成果報告將於該學期最後兩周於課堂中進行成果報告。

Grading

--Group project 30%

--individual project 30%
--Exam 35%
--Participation-5%