Advanced Topics in Heterogeneous Integration System Design

隨著積體電路製程技術的不斷縮小以及應用的多樣化，集合各種功能於單一晶片的整合系統已成為 IC 產業之最大利基。晶片系統(System-on-chip; SoC)及封裝系統(System-in-package; SIP)的設計將可以把如無線通訊、類比、數位、微機電(MEMS)及感測(sensor)整合應用並實現在單一系統，諸如無線感測及無線生醫電子，因此在市場上之潛力無窮。這些可應用的範圍從 smart home, e-Health 到 ubiquitous 國家。許多國家已將此相關產業列為未來科技發展重頭如 u-Japan and u-Korean。這種的異質電子系統設計(Heterogeneous Electronic System Design) 包涵不同領域之技術與系統整合，是一個跨學科領域之整合科學。因此如何有效進行電子系統設計會成為未來國家競爭力之關鍵技術。

本門課程是從系統設計的觀點出發的專題課程，結合感測元件、類比電路或微機電元件專題，開發不同領域之間的共同設計的系統方法及應用。此特論是延續異質整合系統設計的課程，在學生能瞭解及探討各種應用系統中其異質介面之間的設計考量後，學生需於期末完成具異質整合系統之專題設計。

Pre-requisite Courses:
- Heterogeneous Integration System Design (must) and at least one of
- Digital Design related courses or
- Analog Design related courses or
- Radio-Frequency Design related courses

Course Hour Arrangement:
- Lecture & Lab
  Time: Thursday 3:10pm-5:00pm; Friday 8:10am-9:00am
  Location: EE92371
    2/24    EE 92371
    After 2/24    EE 95312 (Chi-Mei Building, SoC Lab)

Materials:
Lecture notes/Lab manuals on course website http://moodle.ncku.edu.tw

NO FOOD AND DRINK IN THE LECTURE HALL
Instructor (in lecturing order):

**Digital**
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Curse Outline
- Introduction to systems, modeling and heterogeneity
- Case Study
- Selected topics in integrating digital modules
- Selected topics in integrating data converters
- Selected topics in integrating PM
- Selected topics in integrating RF devices
- Interface between heterogeneous simulators
- Heterogeneous signals
- Recent researches
- Project proposal/progress/demo

Grading Policy
- Participation
- Homework
- Final Project

NO FOOD AND DRINK IN THE LECTURE HALL
Homework Assignments

- NO late submission will be accepted
- To get credit for your homework assignments, your submissions must be done professionally and seriously. Your official name, course number and homework number must be visibly shown in each assignment.
- All submission will be done electronically through the course website before the specified time. If you fail to do so, your assignment is considered OVERDUE and gets NO credit.

Course Policy

- Encourage you to discuss assigned problems with peers
- Must complete his/her assignment independently or as specified
- Any person/team who is found to be dishonest in homework assignments, examines/quizzes, or the project, the involved person(s) will receive an “0” on the evaluated instrument (paper, exam, project, homework, etc.)

Notes:

- All announcements will be put on the course website from time to time.
- All broadcast emails to you will send through moodle (course website) and only to your email account in NCKU, i.e., nxxxxx@mail.ncku.edu.tw.
- Any other notes will be described during the class session.