Course Content

Course Title (English)	Signal Integrity
Course Title (Chinese)	訊號完整度
Credit	3
Instructor	Prof. Ruey-Beei Wu 吳瑞北 教授
Outline	Since the signal propagation in digital systems has reached 10 Gbps and higher, the frequency range spans from baseband up to millimeter wave. The signal interconnects will encounter many issues due to the electromagnetics effects, such that suitable analysis and design become indispensable to maintain the signal quality. This course will address these issues from both theory and practice, including Ideal Tx-Line Fundamentals Reflection and Crosstalk Interconnection Modeling, R3D, L3D, C3D Non-ideal Conductor Models lectric Properties of Dielectrics Differential Signaling Modelling for Discontinuities I/O Circuits & Models Equalization and Fast Eye-Diagram Analysis 數位系統發展使訊號傳輸已達數 Giga bps 甚至更高，其頻率成份已從涵括基頻到數 GHz 微波波段，連線會面臨許多由於電磁效應產生的問題，需要適當的分析與設計，以維持訊號的品質。本課程將從理論與實際兩方

	面介紹同學各項觀念，含基本時域傳輸線理論、反射串音、有損導線雜訊分析、I/O 模型及眼圖分析等。
Goal	The high-speed signal propagation will suffer from various electromagnetic effects in interconnects, such as signal delay, reflection, crosstalk, switching noise, propagation loss, and so on. This course will explain the physical mechanism of these effects from the view point of electromagnetic fields, perform the electromagnetic analysis and circuit design to improve the signal integrity in the interconnects, and laid the foundation for the continuously evolving development of the high-speed digital systems. 高速訊號傳輸時會受到訊號延遲、反射、串音、切換雜訊、以及傳輸損耗等多種因素影響，本課程可以使同學從電磁場的角度了解上述訊號完整度問題的成因，並利用電磁學的理論進行分析及設計，使連線的訊號品質可以改善，進而建立研發高速數位系統的基礎。
English Teaching	☐ YES ■ NO
Teaching Material	■ English ☐ Chinese