國立東華大學

課　　綱　Course Outline

電機工程學系碩士班國際組

中文課程名稱 Course Name in Chinese	類比積體電路設計				
英文課程名稱 Course Name in English	Analog Integrated Circuit Design				
科目代碼 Course Code	EE__M0190	班 別 Degree	碩士班 Master’s		
修別 Type	選修 Elective	學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite					

課程目標
Course Objectives

學習CMOS類比積體電路設計的基本理論與頻率響應分析，孰悉積體電路的設計與製程，並經由電路模擬軟體驗證類比電路之特性。
To learn the basic theories of CMOS analog integrated circuit design and the analysis of frequency response.
To become familiar with integrated circuit design and manufacturing processes, as well as verify the characteristics of analog circuits through circuit simulation software.

系教育目標
Dept.’s Education Objectives

1	高階人才培育—厚實學生專業知能，培育高階科技人才。 To cultivate talents with advanced professional knowledg
2	團隊分工領導—落實分工合作觀念，具備領導協調能力。 To train students with teamwork leading ability
3	創新思維啟發—訓練專業實用技術，展現創新研發能力。 To inspire students with creative thinkin
4	國際視野養成—營造國際宏觀視野，培育全球市場人才。 To educate students with global perspectiv

	系專業能力 Basic Learning Outcomes	課程目標與系專業能力相關性 Correlation between Course Objectives and Dept.’s Education Objectives
A	培育具備電機電子資訊工程等專業技術研發之能力。 To cultivate the research and developing ability of electrical, electronics and information engineering。	●

B	培育系統分析、模擬驗證、實作實現之能力。 To cultivate the advanced ability of analysis, verification and implementation of systems。	●
C	訓練軟體工具使用與硬體實務驗證相互輔助之能力 To train the auxiliary ability between the utilization of software tool and the verification of the hardware practice。	●
D	訓練電機電子資訊專業知識與工程實務相互結合運用之能力。 To train the integrate ability between professional EECS knowledge and engineering practice	●
E	落實論文研究之群體討論與團隊合作之互助能力。 To fulfill the research ability in thesis by group discussion and teamwork cooperation	○
F	落實發掘問題、邏輯分析、克服瓶頸與持續學習之能力。 To fulfill the ability of question finding, logical analyzing, bottleneck overcoming and continuous learning	●
G	了解學術倫理與智慧財產觀念，掌握國內外產業更迭需求與具備多元專長之能力。 To obtain the ability of multi-specialization and to meet the industry demand as well as to have the ability of academic ethics and concept of intellectual property	○
H	了解國內外市場變化，具備科技英文閱讀溝通與科技論文寫作之能力。 To understand the change of global market and to have the ability of reading, conversation and technical writing in English。	○

圖示說明Illustration ：● 高度相關 Highly correlated ○中度相關 Moderately correlated

課程大綱
Course Outline

本課程介紹類比積體電路的基本原理與電路設計等內容，重點是以CMOS電晶體元件為主，建立類比積體電路設計基礎。課程內容包括有：類比訊號重要性、主被動元件介紹、單級放大器、運算放大器、回授放大器、電流鏡、頻率響應、壓控振盪器、鎖相迴路等，可培養類比積體電路設計與分析的基本能力。

This course introduces the fundamental principles and circuit design of analog integrated circuits, with a focus on CMOS transistor devices, aiming to establish a foundation for analog integrated circuit design. The course content includes the importance of analog signals, introduction to passive and active components, single-stage amplifiers, operational amplifiers, feedback amplifiers, current mirrors, frequency response, voltage-controlled oscillators, phase-locked loops, and more. It aims to develop basic skills in analog integrated circuit design and analysis.

資源需求評估（師資專長之聘任、儀器設備的配合・・・等）
Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)

以具有所開課程專長之教師擔任授課。整理列印授課教材之電腦、影印機。授課所需之黑板與投影機。

The course will be taught by instructors with expertise in the relevant subject area. Computers and photocopiers will be provided for organizing and printing course materials. Blackboard and projectors will be available for teaching.

課程要求和教學方式之建議
Course Requirements and Suggested Teaching Methods

以指定教材按預定進度進行教學，教學方式講授、討論、作業、測驗為主。必要時提供相關補充教材。

Teaching will follow the designated教材 and proceed according to the planned schedule. The teaching methods will primarily include lectures, discussions, assignments, and

tests. Relevant supplementary materials will be provided if necessary.
其他 Miscellaneous