

南台科技大學 98 學年度第 2 期課程資訊

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| 課程名稱 | 電路學(二) |
| 課程編碼 | 30D11002 |
| 系所代碼 | 03 |
| 開課班級 | 四技晶片二甲 |
| 開課教師 | 林永春 |
| 學分 | 3.0 |
| 時數 | 3 |
| 上課節次地點 | 四 6 7 8 教室 I104 |
| 必選修 | 必修 |
| 課程概述 | <ol style="list-style-type: none"> 1. 二階電路分析：RLC 串聯與並聯電路 2. 弦波穩態：相量、分析方法、功率計算 3. 拉氏轉換：簡介、電路分析的應用 |
| 課程目標 | 本課程介紹各種電路分析方法，使學生了解電路分析的觀念及各種計算電路的方法，能在電路設計時應用既有的觀念與方法解決問題、加強工程實務基礎。 |
| 課程大綱 | <ol style="list-style-type: none"> 一. RLC 電路的自然響應與階波響應 <ol style="list-style-type: none"> 1. 簡介 RLC 並聯電路的自然響應 2. RLC 並聯電路的自然響應形式 3. RLC 並聯電路的階波響應 4. RLC 串聯電路的自然響應與階波響應 5. 兩個積分放大器的電路 二. 弦波穩態分析 <ol style="list-style-type: none"> 1. 弦波電源 2. 弦波響應 3. 相量 4. 頻域中的無源電路元件 5. 頻域下的克希荷夫定律 6. 串聯、並聯、Δ-Y 等的化簡法 7. 電源轉換及戴維寧-諾頓等效電路 8. 節點電壓法 9. 網目電流法 10. 變壓器 11. 理想變壓器 12. 相量圖 三. 弦波穩態功率的計算 <ol style="list-style-type: none"> 1. 瞬間功率 |

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| | <ol style="list-style-type: none"> 2. 平均功率與無效功率 3. 均方根值與功率的計算 4. 複數功率 5. 功率的計算 6. 最大功率轉移 <p>四. 拉氏轉換簡介</p> <ol style="list-style-type: none"> 1. 函數轉換 2. 運算轉換 3. 拉氏轉換的應用 4. 反拉氏轉換 5. $F(s)$ 的極點與零點 6. 初值定理與終值定理 <p>五. 拉氏轉換在電路分析上的應用</p> <ol style="list-style-type: none"> 1. S 域中的電路元件 2. S 域中的電路分析 3. 範例 4. 轉移函數 5. 轉移函數的部份分式展開 6. 轉移函數與穩態弦波響應 |
| 英文大綱 | <ol style="list-style-type: none"> 一. Natural and Step Responses of RLC Circuits <ol style="list-style-type: none"> 1. Introduction to the Natural Response of a Parallel RLC circuit 2. The Forms of the Natural Response of a Parallel RLC circuit 3. The Step Response of a Parallel RLC circuit 4. The Natural and Step Response of a Series RLC circuit 5. A circuit with Two Integrating Amplifiers 二. Sinusoidal Steady-State Analysis <ol style="list-style-type: none"> 1. The Sinusoidal Source 2. The Sinusoidal Response 3. The Phasor 4. The Passive Circuit Elements in the Frequency Domain 5. Kirchhoffs Laws in the Frequency Domain 6. Series, Parallel, and Delta-to-Wye Simplifications 7. Source Transformations and Thevenin-Norton Equivalent Circuits 8. The Node-Voltage Method 9. The Mesh-Current Method 10. The Transformer 11. The Ideal Transformer 12. Phasor Diagrams 三. Sinusoidal Steady-State Power Calculation |

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| | 1.Instantaneous Power 2.Average and Reactive Power 3.The rms Value and Power Calculations 4.Complex Power 5.Power Calculations 6.Maximum Power Transfer 四.Introduction to the Laplace Transform 1.Functional Transforms 2.Operational Transforms 3.Applying the Laplace Transform 4.Inverse Transforms 5.Poles and Zeros of F(s) 6.Initial-and Final-Value Theorems 五.The Laplace Transform in Circuit Analysis 1.Circuit Elements in the S Domain 2.Circuit Analysis in the S Domain 3.Applications 4.The Transfer Function 5.The Transfer Function in Partial Fraction 6.The Transfer Function and the Steady-State Sinusoidal Response |
| 教學方式 | 課堂教授, |
| 評量方法 | 自行設計測驗,作業／習題練習,課程參與度(出席率), |
| 指定用書 | ELECTRIC CIRCUITS |
| 參考書籍 | |
| 先修科目 | 微分方程、Laplace 轉換 |
| 教學資源 | |
| 注意事項 | |
| 全程外語授課 | 0 |
| 授課語言 1 | 華語 |
| 授課語言 2 | |
| 輔導考照 1 | |
| 輔導考照 2 | |