

國立台灣大學電機工程學系

99 碩士入學考試筆試參考內容

※ 僅供參考 ※

資料來源：電機系課程綱要授課內容

甲組： 主修自動控制	乙組： 主修電力系統與電力電子	丙組： 主修計算機科學
一、工程數學 C （含 微分方程 、 線性代數 ） 二、 控制系統 三、 電子學乙 四、英文	一、工程數學 C （含 微分方程 、 線性代數 ） 二、 電路學 三、電力工程 （含 電力系統 、 電機機械 、 電力電子 ） 四、英文	一、 離散數學 二、 計算機結構與作業系統 （各佔 50%） 三、 資料結構 四、英文

註：英文由學校統一出題。

微分方程：

1. First order differential equations
2. Differential equations of higher order
3. Laplace transform
4. Series solutions of linear equations
5. Systems of differential equations
6. Fourier series and boundary-value problems
7. Numerical analysis

[BACK](#)

線性代數：

1. Matrices, Vectors, and Systems of Linear Equations
2. Matrices and Linear Transformations
3. Determinants
4. Subspaces and Their Properties
5. Eigenvalues, Eigenvectors, and Diagonalization
6. Orthogonality
7. Vector Spaces

[BACK](#)

控制系統：

1. Introduction to Control Systems
2. Mathematical Models of Systems

3. State Variable Models
4. Feedback Control System Characteristics
5. The Performance of Feedback Control Systems
6. The Stability of Linear Feedback Systems
7. The Root Locus Method
8. Frequency Response Method
9. Stability in the Frequency Domain
10. Design of Feedback Control Systems

[BACK](#)

電子學：(包含電子學一、電子學二、電子學三)

1. Introduction to electronics
2. Principles of OP AMP
3. Diode
4. MOSFET
5. BJT
6. Single Stage IC Amplifiers
7. Differential and Multistage Amplifiers
8. Feedback
9. Internal circuits of Operational Amplifiers
10. Analog-to-digital and digital-to-analog converters
11. Digital CMOS logic circuits
12. Memory and advanced digital circuits
13. Analog filters
14. Signal generators and waveform shaping circuits
15. Output stages and power amplifiers

[BACK](#)

電路學：

1. Circuit Variables and Laws
2. Properties of Resistive Circuits
3. Applications of Resistive Circuits
4. Systematic Analysis Methods
5. AC Circuits
6. AC Power
7. Transient Response
8. Frequency Response and Filters
9. Laplace Transform Analysis
10. Two-Port Networks

[BACK](#)

電力系統：(對應課程：電力工程導論)

1. Background
2. Basic Principles
3. Transmission-line Parameters
4. Transmission-line Modeling
5. Transformer Modeling and the Per Unit System
6. Generator Modeling

[BACK](#)

電機機械：

1. Fundamentals
2. Single/Three Phase Power
3. Power Quality
4. Magnetic Circuits
5. Transformers
6. Motors and Generators
7. Three Phase Induction Motors
8. Power Electronics
9. Synchronous Machines
10. DC Machines
11. Programmable Logic Controllers

[BACK](#)

電力電子：

1. Non-isolated power converter Circuits
2. Isolated power converter Circuits
3. Power MOSFETs and other Power semiconductor Devices
4. Gate Drive Circuit
5. Control of Regulated Converters

[BACK](#)

離散數學：

1. The Foundations: Logic, Sets, and Functions
2. The Fundamentals: Algorithms, the Integers, and Matrices
3. Mathematical Reasoning, Induction, and Recurrence relations
4. Counting
5. Discrete Probability
6. Advanced Counting Techniques
7. Relations

8. Graphs
9. Trees
10. Boolean Algebra
11. Modeling Computation

[BACK](#)

計算機結構：

1. Introduction to Computer Organization.
2. Instruction Set Architecture.
3. Performance and Cost Analysis.
4. ALU Design.
5. Controller and Data-path Design.
6. Pipelining Design.
7. Memory System Design.
8. Input-Output System Design.
9. A Survey of Advanced Architectures.

[BACK](#)

作業系統：

1. Hardware Support for Operating Systems
2. Operating system structure
3. Operating System operations
4. Process management
5. Memory management
6. Operating system services
7. System calls
8. Process scheduling
9. Operations on processes
10. Interprocess communications
11. Thread management
12. Thread programming
13. CPU scheduling
14. Critical section problems
15. Process synchronizations
16. Atomic transactions
17. Deadlocks
18. Virtual memory
19. File systems
20. Secondary storage management
21. RAID

22. Distributed systems

[BACK](#)

資料結構：(對應課程：資料結構)

1. PRELIMINARIES: Introduction. Order Notation. Recursion. Recurrence relations.
2. ABSTRACT DATA TYPES: Stacks. Queues. Lists.
3. LISTS: List operations. List representations. List traversals. Doubly linked lists.
4. TREES: Tree operations. Tree representations. Tree traversals. Threaded trees. Binary trees.
5. DICTIONARIES: Binary search trees. AVL trees. 2-3 trees. B-trees. Red-black trees.
Binomial trees. Splay trees.
6. SETS: Set operations. Set representations. Leftist trees. Heaps. Min-max heaps. Fibonacci
heaps. Union-find. Path compression.
7. HASHING: Chaining. Open addressing. Collision handling.
8. GRAPHS: Graph operations. Graph representations. Basic graph algorithms.
9. MEMORY MANAGEMENT: Garbage collection. Buddy systems.

[BACK](#)