

現行博士班資格考分組考試科目及參考用書或範圍(2008/06/03)

核工與能源組：

反應器物理

J. J. Duderstadt, L. J. Hamilton, "Nuclear Reactor Analysis," John Wiley & Sons, Inc., 1976, Ch. 1-5, 7-10.

E. E. Lewis, W. F. Miller, "Computational Methods of Neutron Transport," John Wiley & Sons, Inc., 1984, Ch. 1-5.

反應器工程

J. H. Rust, "Nuclear Power Plant Engineering," Ch. 1-7.

輻射度量

Glenn F. Knoll, "Radiation Detection and Measurement," third edition, John Wiley & Sons, Inc., Ch. 1-15

輻射屏蔽

J. K. Shultis and R. E. Faw, "Radiation Shielding," Prentice Hall, 1996 or American Nuclear Society, 2000.

J. R. Lamarsh, "Introduction to Nuclear Engineering," Ch. 10.

核工原理

J. Lamarsh and A. Baratta, "Introduction to Nuclear Engineering", 3rd edition, Ch. 1-7.

遷移計算與醫學物理

熱流學

Frank P. Incropera, David P. DeWitt, "Fundamental of Heat and Mass Transfer," JohnWiley & Sons.

流體力學

Munson, "Fundamentals of Fluid Mechanics", Ch. 1-9

工程熱力學

Michael. J. Moran, Howard. N. Shapiro, "Fundamentals of Engineering Thermodynamics", 6 th Edition, JohnWiley & Sons, Inc. Ch. 1-13.

應用力學(含工程力學、材料力學)

(工力)

Hibbeler, "Engineering Mechanics, Statics", Ch. 1, 2, 3, 4, 5, 6, 8, 11

2

(材料力學)

William F. Riley, Leroy D. Sturges, and Don H. Morris, "Mechanics of Materials", Ch. 1-8.

奈微系統組：

電路分析(電路學)

C.K. Alexander and M. N. O. Sadiku, "Fundamentals of Electric Circuits", Concise Edition, Ch. 1-10, Ch. 13 except. 13.6 and .7, Ch. 14

電子元件

Sedra/Smith, "Microelectronic Circuits", Oxford, 5th Ed, Ch. 1-5, (即電子1).

電子系統

Sedra/Smith, "Microelectronic Circuits", Oxford, 5th Ed, Ch. 6-14, (即電子2 和 電子3).

控制系統

M. Gopal, "Control Systems", Ch. 3.2-3.4, Ch. 4-Ch. 10.

材料熱力學

- (1) The First Law of Thermodynamics
- (2) The Second Law of Thermodynamics
- (3) Auxiliary Functions
- (4) Heat Capacity, Enthalpy, Entropy, and The Third Law of Thermodynamics
- (5) The Behavior of Gas
- (6) Phase Equilibria in a One-Component System
- (7) The Behavior of Solutions
- (8) Gibbs Free Energy - Composition and Phase Diagrams of Binary Systems
- (9) Chemical Reactions (gas-gas and gas-condensed phase reactions)

參考書：

D.R. Gaskell, Introduction to The Thermodynamics of Materials, 4th ed., Ch. 1-12, McGraw-Hill, 2004.

物理冶金(含高等物理冶金)

物理冶金

- (1) Crystal Structure of Metals
- (2) Defects in Crystals
- 3
- (3) Substitutional and Interstitial Diffusion

- (4) Phase Diagrams
- (5) Deformation of Metals
- (6) Annealing
- (7) Nucleation and Growth
- (8) Solidification
- (9) Nonferrous Alloys Al, Cu, Ti
- (10) Ferrous Alloys (steel)
- (11) Fracture, Creep and Fatigue

高等物理冶金

- (1) Crystal Interface and Microstructure
- (2) Theory of Nucleation and Growth
- (3) Diffusional Transformations in Solids
- (4) Diffusionless Transformation

參考書：

物理冶金

R.E. Reed-Hill and R. Abbaschian, *Physical Metallurgy Principles*, 3rd ed., PWS-KENT, 1992.

高等物理冶金

D.A. Porter and K.E. Easterling, *Phase Transformations in Metals and Alloys*, 2nd ed., Chapman & Hall, 1993.

晶體缺陷

微系統工程原理

生物化學與分析化學

1. **Biochemistry, 6th Edition**, Chapters 3 through 13 (pp 65 ~ 403), Mary K. Campbell and Shawn O. Farrell, Thomson Brooks/Cole.

2. **Fundamentals of Analytical Chemistry, 8th Edition**, Parts IV through VI (Chapters 18 through 33; pp 487 ~ 1019), Douglas A. Skoog, Donald M. West, F. James Holler and Stanley R. Crouch, Thomson Brooks/Cole.

3. *Bioanalytical Chemistry* by Susan R. Mikkelsen and Eduardo Corton (2004) published by John Wiley & Sons Inc.

奈米科技導論(TIGP)

計算材料科學(TIGP)

尖端奈米結構之製造與分析(TIGP)

固態物理導論

C. Kittel, Introduction to Solid State Physics, (7th or 8th ed.), Ch. 1-9

半導體元件物理

(1) Semiconductor Devices: Physics and Technology, 2nd Edition by Simon M. Sze Ch1~Ch6

(2) Semiconductor Physics and Devices, 3rd ed. by Donald Neamen, Ch1~Ch12

工程物理組：

電磁學

D. Griffith, Introduction to Electrodynamics, 3rd ed.

電漿物理

Dwight R. Nicholson, Introduction to Plasma Theory.

電漿工程

(1) B. Chapman, "Glow Discharge Processes, sputtering and plasma etching", John Wiley & Sons, New York, 1980.

(2) M. A. Liberman and A. J. Lichtenberg, "Principles of Plasma Discharges and Materials Processing", John Wiley & Sons, New York, 1994. Ch. 10 - Particle and Energy Balance in Discharges, Ch. 12 - Inductive Discharges, Ch. 13, Section 1 - ECR discharges

近代物理

(1) Arthur Beiser, Concepts of Modern Physics, 6th ed., McGraw Hill, 2003. Ch. 1-7

(2) R. A. Serway, C. J. Moses, C. A. Moyer, Modern Physics, 3rd edition, Saunders College Publishing, 2005, Ch. 1-9

固態物理導論

C. Kittel, Introduction to Solid State Physics, (7th or 8th ed.), Ch. 1-9

輻射度量

Glenn F. Knoll, "Radiation Detection and Measurement," third edition, John Wiley & Sons, Inc., Ch. 1-15

半導體元件物理

(1) Semiconductor Devices: Physics and Technology, 2nd Edition by Simon M. Sze Ch1~Ch6

(2) Semiconductor Physics and Devices, 3rd ed. by Donald Neamen, Ch1~Ch12