

博士班資格考注意事項

■ 說明事項：

1. 學生須於入學七學期內，資格考須通過學科考試三科，其中一科為共同必考外，另二科為選考。
2. 共同必考科目為（下列二個單元選一個）：
 - (1)第一單元：數學【含線性代數、微分方程、機率】【三選二】100分。
 - (2)第二單元：電子學（必選）佔50分及電路學、電磁學【二選一】佔50分。
3. 共同科目於本系網頁上有參考題庫，其中50%乃參考題庫之技術觀念而出，但可能另輔以題型等變化；另外50%則是自由出題。
4. 各組可選考之專業科目為：

組別	考試科目
通訊系統組	數位通信、隨機程序
網路通訊組	排隊理論、通訊協定、電腦網路、網路最佳化
信號與媒體通訊組	語音處理、醫學信號處理、影像處理、數位信號處理
計算機機電工程組	電腦視覺、類神經網路與模糊系統、人工智慧、機器人學
晶片系統組	Digital SOC Design、Mixed-Signal Design、SOC Architecture、SOC Design Methodology
電磁晶片組	高等電磁理論、射頻與微波電路設計
電力與電能處理甲組	高等電機理論、電力電子學、控制系統、高功率元件分析與設計
電力與電能處理乙組	再生能源與電力系統、電力系統運轉與控制

***99學年度第二學期前入學學生，仍可選考「通訊系統」，但不可同時選考「通訊系統」與「網路最佳化」兩科為資格考科目。**

- (1)網路通訊組的博士班資格考下學期考科原本為：『電腦網路』、『通訊系統』。
- (2)『通訊系統』擬變更為『網路最佳化』。
- (3)參考書目：Routing, Flow, and Capacity Design in Communication and Computer Networks, Michal Pioro and Deepankar Medhi, Elsevier。
- (4)變更自99學年度第2學期起實施，100.01.14電機/通訊系第四次聯合系務會議通過。

博士班資格考參考書目

共同科

1. 數學：

- Kreyszig, “Advanced Engineering Mathematics”.
- Landesman and Hestenes, “Linear Algebra For mathematics,” Science and Engineering.
- Hoel, Port, and Stone, “Introduction to Probability Theory”.

2. 電子學／電路學：

◆ 電子學

- Jacob Millman and Arivin Grabel, Microelectronics, 2nd edition, McGraw Hill, 1998.
- Adel S. Sedra and Kenneth C. Smith, Microelectronics Circuits, Fourth edition, HRW, 1992.

◆ 電路學

- James W. Nilsson, “Electric Circuits,” Fourth Edition, Addison-Wesley, 1993.
(殷實公司出售)

◆ 電磁學

- Guru and Hiziroglu, "Electromagnetic Field Theory Fundamentals," Cambridge University Press.

通訊系統組

1. 數位通信：

- R. Ziemer and R. Peterson, “Introduction to Digital Communication,” McMillar Publishing Co., Chap. 1-4, 1992, 開發圖書公司.
- E. A. Lee and D. G. Messerschmitt, “Digital Communication,” Kluwer Academic Pub., 1988. Chaps 1-7.

2. 隨機程序：

- Alberto Leon-Garcia, “Probability and Random Processes for Electrical Engineering” (2nd ed.), Chap. 6- Chap. 8.
- W. A. Gardner, “Introduction to Random Processes,” second ed., 1990. Chaps 1-6, 9-10.

網路通訊組

1. 排隊理論：

- L. Kleinrock, “Queueing Systems”, Vol. 1, Chap 1-6, Vol. II, Chap 3.

2. 通訊協定：

- D. Comer, “Internetworking with TCP/IP, Volume I, Chapter 1-Chapter 19”.
- R, Onvural, Asynchronous Transfer Mode Network Performance Issues, 2nd ed.

3. 電腦網路：

- A. Tanenbaum, “Computer Networks” 3rd Ed., Chap 1-5.
- A. Leon-Garcia and I. Widjaja, "Communication Networks," Chap 1-10.

4. 網路最佳化：

- *Routing, Flow, and Capacity Design in Communication and Computer Networks*, Michal Pioro and Deepankar Medhi, Elsevier.

5. 通訊系統：(100 學年度第 1 學期將移除)

- Smith, “Digital Transmission System”.
- ”Telecommunications Transmission Engineering,” Bell Labs, 2nd ed.

信號與媒體通訊組

1. 語音處理：

- A. M. Kondoz, Digital Speech – coding for low bit rate communications system, John-Wiley & Sons Inc., 1994.

2. 醫學信號處理：

- M. Akay, Biomedical Signal Processing, Academic Press, 1994.
- Eugene N. Bruce, Biomedical Signal Processing and Signal Modeling, John Wiley & Sons, Inc., 2001.

3. 影像處理：

- Anil K. Jain, *Fundamentals of Digital Image Processing*, Prentice-Hall Inc., 1989.
- Rafael C. Gonzalez and Richard E. Woods, *Digital Image Processing*, Addison-Wesley Inc., 1993.

4. 數位信號處理：

- Oppenheim & Schaffer ”Discrete-Time Signal Processing”, 2nd Edition, Prentice Hall, 1999.
- Emmanuel C. Ifeakor, Barrie W. Jervis, “Digital Signal Processing: A Practical Approach”, 2nd Edition, Prentice Hall, 2002.

計算機、機電工程組

1. 電腦視覺：

- Machine Vision, by R. Jain, R. Kasturi, and B. G. Schunck, McGraw-Hill , 1995.
- Introductory Techniques for 3-D Computer Vision, by E. Trucco and A. Verri, Prentice Hall, 1998.

2. 類神經網路與模糊系統：

- Neuro-Fuzzy and Soft Computing, by J.-S. R. Jang, C.-T. Sun, and E. Mizutani, Prentice Hall, 1998.

3. 人工智慧：

- Artificial Intelligence: Structures and Strategies for Complex Problem Solving, Fifth Ed., by George F. Luger and William A. Stubblefield, Addison-Wesley, 2005.(Ch.1-Ch.8, Ch.13,Ch.15)
- Artificial Intelligence: A Modern Approach, Second Ed., by Stuart Russell and Peter Norvig, Prentice Hall, 2003.(Ch.1-Ch.10)

4. 機器人學：

- Autonomous Mobile Robots, by R. Siegwart and I. R. Nourbakhsh, MIT Press, 2004.

晶片系統組

1. Digital SOC Design

- Courses : Advance VLSI Design, Digital IP Design, Design for Low-Power Integrated Circuits
- 王進賢, VLSI 電路設計, 高立圖書, 2000.
- Rabaey, Digital Integrated Circuits, Prentice Hall.
- M. Keating and P. Bricaud, Reuse Methodology Manual, Kluwer Academic.
- A. P. Chandraskan and. R. Brodersen, Low Power Digital CMOS Design, Kluwer Academic.
- T. Burd and R. Brodersen, Energy Efficient Microprocessor Design, Kluwer Academic.
- A. Bellaouar, and M. I. Elmasry, Low-Power Digital VLSI Design, Kluwer, 1995.
- C. Piguet, Low-Power Electronics Design, CRC PRESS, 2005.

2. Mixed-Signal Design

- Courses : Analog Integrated Circuits, Mixed-Signal Integrated Circuits
- Behzad Razavi, “Design of Analog CMOS Integrated Circuits, McGraw-Hill, 2001
- David A. Johns, and Ken Martin, “Analog Integrated Circuit Design,” John Wiley & Sons, Inc., 1997
- Phillip E. Allen ,and Douglas R. Holberg, “CMOS Analog Circuit Design,”New

York Oxford, Second Edition, 2002

3. SOC Architecture :

- Courses : VLSI Architecture, SoC Architecture*
- Vijayk. Madiseti, “VLSI Digital Signal Processors,” IEEE Press, 1995.
- John D. Hayes, “Computer Architecture and Organization,” McGraw-Hill, 1998.
- John L Hennessy and David A Patterson, “Computer Architecture A Quantitative Approach,” Third edition, Morgan Kaufmann, 2003.

4. SOC Design Methodology

- Courses : Application-Specific Integrated Circuits, Computer-Aided Design of VLSI Circuits
- References:
- S. M. Sait and H. Youssef, VLSI Physical Design Automation, McGraw-Hill, 1995.
- M.J.S. Smith, Application-Specific Integrated Circuit, Addison-Wesley Publisher, 1997.
- David Chinnery, and Kurt Keutzer, Closing the power gap between ASIC & Custom, Springer, 2006.
- L.-T. Wang, Y.-W. Chang, and K.-T. Cheng, Electronic Design Automation: Synthesis, Verification, and Test (Systems on Silicon), Morgan Kaufmann, 2009.
- S. H. Gerez, Algorithms for VLSI Design Automation, John Wiley & Sons, 1999.

電磁晶片組

1. 高等電磁理論 :

- C. A. Balanis, Advanced Engineering Electromagnetics, John Wiley & Sons, 1989, Chapter 1- Chapter 10.
- R. F. Harrington, Time-Harmonic Electromagnetic Fields, McGraw-Hill, 1993, Chapter 1- Chapter 6.

2. 射頻與微波電路設計 :

- E. H. Fooks and R. A. Zakarevicius, *Microwave Engineering Using Microstrip Circuits*, Prentice Ha.. 1990.
- T. Edwards, *Foundations for Microstrip Circuit Design*, John Wilet & Sons, 1992.
- P. Vizmuller, RF Design Guide—Systems, Circuits, and Equations, Artech House, 1995.
- G. Gonzalez, *Microwave Transistor Amplifiers Analysis and Design*, Prentice-Hall, 1995.
- D. M. Pozar, *Microwave Engineering*, Addison-Wesley, 1990.

電力與電能處理甲組

1. 電力電子學：

- N. Mohan, T. M. Undeland and W. P. Robbins, *Power Electronics*, John Wiley & Son, 2nd ed., 1994.
- J. G. Kassakian, et. al., *Principles of Power Electronics*, Addison Wesley, 1991.

2. 高等電機理論

- P. C. Krause, O. Wasynczuk and S. D. Sudhoff, *Analysis of Electric Machinery and Drive Systems*, IEEE Press, 2002.

3. 控制系統

- B. C. Kuo, "Automatic Control Systems", 9th edition. John Wiley & Sons, 2010.

4. 高功率元件分析與設計：

- R. S. Ramshaw, *Power Electronics Semiconductor Switches*, 2nd ed., Chapman & Hall, 1993.
- D. Jiles, *Introduction to Magnetism and Magnetic Materials*, Chapman and Hall, 1991.
- N. R. Grossner, *Transformers for Electronic Circuits*, 2nd ed., 1990.

電力與電能處理乙組

1. 電力系統

- H. Saadat, *Power System Analysis*, McGraw-Hill, 2nd Ed., 2004.
- J. Grainger & W. Stevenson Jr., *Power System Analysis*, McGraw Hill, 1994. 2nd Ed., 1994.

2. 再生能源

- G. M. Masters, *Renewable and Efficient Electric Power Systems*, John Wiley & Sons, 2004.

3. 電力系統運轉與控制：

- A. J. Wood and B. F. Wollenberg, "Power Generation, Operation, and Control," John Wiley & Sons, 2nd Ed., 1996.