

博士學位候選人資格考核實施辦法附加說明【113 版】

960416/980108/990105/1000601/1110607/1130702 學委會

一、筆試：

- 筆試各類成績以佔分比例加權平均計算後，成績達 70 分(含)以上者，毋需審查，通過資格考核。
- 單門成績 70 分(含)以上，重考時該門得免考，惟其成績不列入加權平均計算。
- 關書考試一律不得攜帶參考資料。
- 筆試科目、佔分比例、考試時間、考試方式及注意事項：
 - 每門考試時間均為 100 分鐘，總分 100 分。
 - 考試方式：除電力系統外，其他均為關書考試。

組別	考試科目	佔分比例及注意事項
控制組	1.控制系統 2.線性系統	每門需 70(含)分以上
電力組	1.工程類 1 門--電路學(共 1 科) 2.專業類 1 門--下列 2 門選考 1 門 (1)電力電子學(共 1 科) (2)電力系統(含電力系統控制與穩定度、電腦電驛，共 2 科，每科佔分 50%)	工程類 30% 專業類 70%
計算機科學組	1.數學類 1 門--下列 5 科選考 2 科 線性代數、微分方程、離散數學、複變、機率與統計 2.工程類 1 門--演算法、資料結構 (共 2 科) 3.專業類 1 門--計算機系統(下列 3 科選擇 2 科組成) 作業系統、計算機結構、電腦網路	數學類 30% 工程類 30% 專業類 40%
資訊安全組	1.機器學習 2.密碼學 3.電腦通信網路	3 門平均計算

二、抵免筆試：需事前申請，由學術委員會提請各組討論後做成推薦，交付學術委員會決議是否同意抵免。抵免通過後，成績以該門(科)總分之 70% 計。

控制組：無論文發表抵免，抵免門數不限。

電力組：最多可抵免 2 科。其中修課抵免最多 1 科，論文發表抵免最多 1 科。

計算機科學組：無修課抵免，數學類不可抵免，最多可抵免 2 科。

資訊安全組：最多可抵免 2 門。

1.以修課抵免筆試：各組修課抵免之課程及成績標準如下。需為 5 年內修習之課程。

控制組：

考試科目	課號	課程識別碼	可抵免之課程	成績標準
控制系統	EE3024	901 43100	控制系統	A 或 A+
	ME3007	502 45100	自動控制	A 或 A+
線性系統	EE5128	921 U8200	線性系統	A 或 A+
	ME5220	522 U5040	線性控制系統	A 或 A+

電力組：

考試科目	課號	課程識別碼	可抵免之課程	成績標準
電路學	EE2004	901 20100	電路學 ^{*註}	B-以上
電力電子學	EE5002	921 U0080	電力電子學	A-以上

電力系統控制與穩定度	EE5102	921 U6110	電力系統控制與穩定度	A 或 A+
電腦電驛	EE5068	921 U3030	電腦電驛	A 或 A+

*註：電路學若以非表列課號之本系成績抵免，需經電力組學術委員同意，並送學術委員會審查。

計算機科學組：無修課抵免。

資訊安全組：

考試科目	課號	課程識別碼	可抵免之課程	成績標準
機器學習	EE5184	921 U2620	機器學習(4學分)	B-以上
密碼學	EE5060	921 U2780	密碼學	B-以上
電腦通信網路	EE5025	921 U1080	電腦通信網路	B-以上
	EE5188	921 U2660	網路攻防實習	B-以上

2 以論文發表抵免筆試：

- (1)論文需為該學生與指導教授共同發表，並註明本系為第一論文發表單位，該學生必須為指導教授除外之第一作者。
- (2)抵免之論文可用於論文審查。
- (3)各組可抵免之會議論文及期刊如下，其他相同等級會議或期刊，由各組決議。

控制組：無。

電力組：

期刊：

1	IEEE Transactions on industrial electronics
2	IEEE Transactions on power electronics
3	IEEE Journal of Emerging and Selected Topics in Power Electronics (JSTPE)
4	IEEE Transactions on Industry Applications
5	IEEE Open Journal of Power Electronics
6	IEEE Transactions on SMART GRID
7	IEEE Transactions on SUSTAINABLE ENERGY
8	IEEE Transactions on POWER SYSTEM
9	IEEE Transactions on CIRCUITS and system-I
10	IET Transactions on power electronics
11	IEEE ACCESS
12	IEEE Transactions on Transportation Electrification
13	IEEE Open Journal of Industrial Electronics
14	IEEE Open Journal of Industry Applications
15	IEEE Transactions on Energy Conversion
16	IEEE Transactions on Power Delivery
17	IEEE Open Access Journal of Power and Energy

計算機科學組：可申請抵免該項專業類或工程類科目(數學類不可抵免)，論文需與抵免科目相關。

期刊：品質等同優良期刊或以上。請參考本院傑出期刊或優良期刊清冊。

http://www.eecs.ntu.edu.tw/zh_tw/DepartmentsPrograms/info5

會議論文：品質等同下表或以上。

No	Conference	Fields	Subfields	Accept Rate
1	FME	Computer-Aided Design	Formal Method	23%
2	ISSTA	Computer-Aided Design	Software Testing	26%
3	TACAS	Computer-Aided Design	System Tools	25%
4	International Test Conference	Computer-Aided Design	Testing	30%
5	VLSI Test Symposium	Computer-Aided Design	Testing	30%
6	CAV	Computer-Aided Design	Verification	29%
7	IEEE/ACM DAC	Computer-Aided Design	EDA	21%
8	IEEE/ACM DATE	Computer-Aided Design	EDA	21%
9	IEEE/ACM ICCAD	Computer-Aided Design	EDA	23%
10	ACM CIKM	Data mining	Data mining	20%
11	IEEE ICDM	Data mining	Data mining	20%
12	SIAM SDM	Data mining	Data mining	20%
13	ACM SIGMOD	Database	Database	15%
14	EDBT	Database	Database	14%
15	IEEE ICDE	Database	Database	18%
16	VLDB	Database	Database	14%
17	ACM SIGKDD	Knowledge discovery	Knowledge discovery	15%
18	ACM/IEEE ICSE	Software Engineering	Software Engineering	9%
19	IEEE International Symposium on Software Reliability Engineering (ISSRE)	Software Engineering	Software Engineering	25%
20	ACM MM	System, Network, Security	Applications	15%
21	ACM WWW	System, Network, Security	Applications	14%
22	IEEE/IFIP DSN	System, Network, Security	Dependable Systems	19%
23	IEEE ICDCS	System, Network, Security	Distributed Systems	14%
24	IEEE IPDPS	System, Network, Security	Distributed Systems	23%
25	IEEE PERCOM	System, Network, Security	Distributed Systems	8%
26	IEEE INFOCOM	System, Network, Security	General Networks	18%
27	ACM MOBICOM	System, Network, Security	Mobile Networks	11%
28	ACM MOBIHOC	System, Network, Security	Mobile Networks	10%
29	ACM MOBISYS	System, Network, Security	Mobile Networks	15%
30	ACM SenSys	System, Network, Security	Mobile Networks	14%
31	IEEE SECON	System, Network, Security	Mobile Networks	25%
32	IEEE/ACM IPSN	System, Network, Security	Mobile Networks	15%
33	ACM Sigcomm	System, Network, Security	Networking	12%
34	International World Wide Web Conference (WWW)	System, Network, Security	Networking	11%
35	ASIACRYPT	System, Network, Security	Security	16%
36	CRYPTO	System, Network, Security	Security	16%
37	EUROCRYPT	System, Network, Security	Security	18%
38	USENIX Security Symposium	System, Network, Security	Security	14%
39	IEEE Conference on Nanotechnology (IEEE-NANO)	System, Network, Security	System	30%
40	IEEE International Symposium on Circuits and Systems(ISCAS)	System, Network, Security	System	30%
41	ACM SIGMETRICS	System, Network, Security	System Performance	13%
42	ACM CCS	System, Network, Security	System Security	14%
43	IEEE Security & Privacy	System, Network, Security	System Security	12%
44	ACM PODC	System, Network, Security	Theory	23%
45	ACM SODA	Theoretical Computer Science	Theory	27%
46	ACM STOC	Theoretical Computer Science	Theory	30%
47	ICALP	Theoretical Computer Science	Theory	26%
48	IEEE FOCS	Theoretical Computer Science	Theory	22%
49	ACNS	Security	Cryptography	18%
50	ASIACCS	Security	Cryptography	25%
51	CHES	Security	Cryptography	27%

52	CT-RSA	Security	Cryptography	30%
53	PKC	Security	Cryptography	31%
54	SAC	Security	Cryptography	30%

References

- [1] The ACM Digital Library (<http://portal.acm.org/dl.cfm?coll=portal&dl=ACM&CFID=4647136&CFTOKEN=72221600>)
[2] Networking Conferences Statistics (<http://www.cs.ucsb.edu/~almeroth/conf/stats/>)
[3] Some CS Conference Statistics (http://www.cs.berkeley.edu/~pbg/conf_stats/)
[4] ACNS: 是密碼學暨資訊安全方面高水準的國際會議之一，平均接受率為 17.7%
[5] ASIACCS: 資訊安全方面高水準國際會議，亞洲版的 CCS，接受率約 25%
[6] CHES: 密碼學界最重要的高水準國際會議之一，2015 年的接受率為 27%，PR 約 9.2%
[7] CT-RSA: 資訊安全最大國際會議 RSA 中的 Cryptographer's track，接受率約 30%，PR 約 25%
[8] PKC: 密碼學界最重要的高水準國際會議之一，2015 年的接受率為 31%，PR 約 28.7%
[9] SAC: 密碼實作方面高水準國際會議，接受率約 30%
註：PR = #accepted papers / #registered participants，亦即與會者當中約略是來發表文章的比率，而 1 - PR 則大約是沒有發表論文、純粹是來吸取新知的比率

資訊安全組：論文需與抵免科目相關。

期刊：品質等同下表或優良期刊或以上。優良期刊請參考本院傑出期刊或優良期刊清冊。http://www.eecs.ntu.edu.tw/zh_tw/DepartmentsPrograms/info5

No	Name	IF
1.	IEEE (ACM) Transactions and Magazines.	
2.	TISSEC-ACM Transactions on Information and System Security	1.78
3.	DCC-Designs, Codes and Cryptography	1.52
4.	IEEE Security & Privacy	2.62
5.	IEEE Transactions on Information Forensics and Security	6.01
6.	IEEE Transactions on Dependable and Secure Computing	8.94
7.	Elsevier Computers & Security	3.57
8.	International Journal of Advanced Computer Science and Information Technology	1.3
9.	International Journal of Information Security	1.49
10.	ACM Transactions on the Web	2.0
11.	ACM Transactions on Embedded Computing Systems	1.53
12.	JOC-Journal of Cryptology	1.2

會議論文：品質等同下表或以上。

1.	S&P - IEEE Symposium on Security and Privacy
2.	CCS - Computer and Communications Security
3.	USENIX Security Symposium - USENIX Security Symposium
4.	CSFW - Computer Security Foundations Workshop
5.	NDSS - Network and Distributed System Security Symposium
6.	DSN - Dependable Systems and Networks
7.	ESORICS - European Symposium on Research in Computer Security
8.	RAID - International Symposium on Recent Advances in Intrusion Detection
9.	CSF - IEEE Computer Security Foundations Symposium.
10.	SAC - ACM Symposium on Applied Computing
11.	CNS - IEEE Conference on Communications and Network Security
12.	ICISC - International Conference on Information Security and Cryptology
13.	Globecom,
14.	ICC
15.	PIMRC

三、筆試參考書目

線性代數、微分方程、離散數學、複變、機率與統計、電路學、演算法、資料結構
→請參考本系大學部課程綱要。

控制系統	(1) Feedback Control of Dynamic Systems, by G. F. Franklin, J. D. Powell, and A. Emami-Naeini (2) Modern Control Systems, by R. C. Dorf
線性系統	(1) Linear System Theory and Design, by C.-T. Chen (2) A Linear Systems Primer, by P. Antsaklis and A. Michel, (3) Linear System Theory, by W.J. Rugh (4) Linear Systems by T. Kailath
電力電子學	請參考上課講義
電力系統控制與穩定度	P.M. Anderson, Power System Control and Stability
電腦電驛	"Computer Relaying for Power Systems" by Arun G.Phadke, James S. Thorp
作業系統	Abraham Silberschatz, Peter Baer Galvin, and Greg Gagne, Operating System Concepts, 7th Edition.
計算機結構	David A. Patterson and John L. Hennessy, Computer Organization and Design: The Hardware Software Interface, 5th edition, Morgan Kaufmann, 2014.
電腦網路	James F. Kurose and Keith W. Ross, Computer Networking: A Top-Down Approach Featuring the Internet, 5th Edition.
機器學習	• Introduction to Machine Learning, Ethem Alpaydin, 2009, MIT Press • Pattern Recognition and Machine Learning, Christopher M. Bishop, 2006, Springer
密碼學	Introduction to Modern Cryptography: Principles and Protocols Jonathan Katz, Yehuda Lindell, 2nd edition, CRC Press, 2015.
電腦通信網路	Computer Networks, Andrew S. Tanenbaum, Prentice Hall

控制組資格考 Outline and Reference Exam

I. Control Systems

- Mathematical modeling of dynamic systems in the frequency domain (Laplace transforms, transfer functions)
- Block diagram manipulations
- Stability; Routh Hurwitz Criterion
- Transient response; transient performance specifications (overshoot, rise time, settling time)
- Steady state errors; final value theorem; system type; steady state performance
- Root locus analysis and design; closed loop root locations and transient performance
- Frequency response methods (bode, nyquist); frequency domain analysis (gain margin, phase margin, band width)

- Frequency domain loop shaping
- Compensator design using PID controllers, lead, lag and integral action
- Reference
 - i. *Feedback Control of Dynamic Systems* by G. F. Franklin, J. D. Powell, and A. Emami-Naeini
 - ii. *Modern Control Systems* by R. C. Dorf

II. Linear Systems

- State-space representation of continuous-time and discrete-time control systems
- Relevant methods and results from linear algebra, such as eigenvalues and eigenvectors, singular values, the Cayley-Hamilton theorem, Jordan form
- Matrix exponentials, state-transition matrices, impulse-response functions
- Stability of linear systems, Lyapunov functions and Lyapunov equations
- Controllability, stabilizability, observability, detectability; controllability, and observability diagrams
- Control and observer canonical forms, companion form
- Stabilization and pole-placement by feedback
- Reconstruction of state vector and state observer feedback
- Relationships between state-space representations and frequency-domain representations
- Reference
 - i. *Linear System Theory and Design* by C.-T. Chen
 - ii. *A Linear Systems Primer* by P. Antsaklis and A. Michel
 - iii. *Linear System Theory* by W.J. Rugh
 - iv. *Linear Systems* by T. Kailath