

مواد الامتحان التنافسي للمتقدمين على الدراسات العليا في كلية هندسة المعلومات للعام الدراسي ٢٠٢٤/٢٠٢٥

١- المواد المطلوبة للامتحان التنافسي للقبول بدراسة الدكتوراه في قسم هندسة المعلومات والاتصالات:

No.	Subject	Marks	Topics	Text Book or References
1	Information and Network Security	15	Hash functions, MAC, Digital signature, Key management, user authentication, malicious software, transport security, E-mail security, IPSec, Intrusion, firewalls.	William Stallings, "Cryptography and Network Security; Principles and Practice", 7 th edition, 2017.
2	Computer Networks	15	1. Application layer. 2. Transport layer. 3. Network layer. 4. Datalink layer.	Computer networking: A top down approach By: Kurose and Ross "Computer networks" By Tanenbaum.
3	Multimedia Computing	15	Multimedia systems, Speech signal encoding, Audio signal encoding, Image encoding, Video encoding, Multimedia over networks.	Jenq-Neneg Hwang, "Multimedia Networking from Theory to Practice", Cambridge University Press 2009.
4	Digital Signal Processing	15	Chapters one, two, three, four, and five.	John G. Proakis and Dimitris G. Manolakis, "Digital Signal Processing: Principles, Algorithms and Applications", 4 th edition.
5	Wireless and Mobile Communications	20	Ref#1 & 2 Baseband transmission, Multiplexing techniques, Digital modulation, Wireless Channel model, Multicarrier Modulation & OFDM, Spread Spectrum communications, Diversity techniques, MIMO and Wireless Capacity. Ref#3 Introduction to telecommunication system and signal digitization, Cellular system concept, planning, design, Traffic measurements, System`s antenna, free space losses, Mobile channel characteristics, 2G System, 2.5 GPRS system, 3G UMT System, Wireless LAN technology, Wi-Fi, IEEE 802.11 Architecture, WAP, Bluetooth and IEEE 802.15.	1. Tse & Viswanath, "Fundamentals of Wireless Communication", Cambridge University Press, 2005. 2. Andrea Goldsmith, "Wireless Communications", 2nd Edition, Cambridge University Press 2005. 3. Asoke K. Talukaler, "Mobile Computing", McGraw-Hill, 2007.
6	Information Theory & Coding	20	Discrete and Continues Random Variables, Source Entropy and Efficiency, Average mutual Information, Channel capacity and efficiency for memoryless channel, Symmetric channel, Shannon-Hartley Equation, Source Coding Theorem, Channel Coding, ARQ, Linear Block Codes, Syndrome Decoding, Hamming Codes.	1. G. Fiche & G. Hébuterne, "Mathematics for Engineers", 1st Ed., John Wiley & Sons, Inc., 2007. 2. J. C. Moreira & P.G. Farrell, "Essentials of Error Control Coding", 1st Ed., Prentice Hall, 2006.
Total		100		

مواد الامتحان التنافسي للمتقدمين على الدراسات العليا في كلية هندسة المعلومات للعام الدراسي ٢٠٢٤/٢٠٢٥

٢- المواد المطلوبة للامتحان التنافسي للقبول بدراسة الماجستير في قسم هندسة المعلومات والاتصالات:

No.	Subject	Marks	Topics	Text Book or References
1	Computer Networks	14	Internetworking, OSI layer, TCP/IP layer, IP layer, IPv6, IPv4, Routing protocols (OSPF, EIGRP), Wireless network (802.11 protocol), Network Security (ACL)	<ol style="list-style-type: none"> 1. Todd lammle, "routing & switching". 2. Cisco press, "wireless Network administration".
2	Communication Systems	15	Spectral analysis, Analogue modulation, Sampling of analogue signals, Digital baseband transmission, Digital sinusoidal modulations, Noise in communication systems, Multiplexing techniques, Matched filter, Optimum detection, Transmission media, and spread spectrum communications.	P. Lathi and J. Ding, "Modern Digital & Analogue Communication Systems", 4th edition, Oxford University Press, 2010.
3	Multimedia Computing & Image Processing	14	Introduction to multimedia networking, speech signal, speech signal encoding, Audio signal, Audio signal encoding, compression techniques, image processing, Image encoding, video signal, video encoding, multimedia over networks, Applications. Image processing (first four chapters from reference 2)	<ol style="list-style-type: none"> 1. JENQ-NENG HWANG, Multimedia Networking - From Theory to Practice (2009). 2. Rafael C. Gonzalez and Richard E. Woods, Digital image processing, 3rd ed. 2008.
4	Cryptography & Information Security	14	Computer and Network Security Concepts (chp. 1) Classical Encryption Techniques (chp. 3) E-mail security, S/MIME, PGP, (chp.19) IP security (chp. 20) Malicious Software (chp. 21) Firewalls (chp. 23)	William Stallings, "Cryptography and Network Security; Principals and Practice", 7 th edition, GLOBAL EDITION, 2017.
5	Digital Signal Processing	14	Chapters one, two, and three	John G. Proakis and Dimitris G. Manolakis, "Digital Signal Processing: Principles, Algorithms and Applications", 4 th edition.
6	Engineering Analysis & Probability Theory	15	First-order differential equations, Matrices, Laplace Transform, Fourier Series, Fourier Transform, Probability theory, Discrete and Continues Random Variables, Expectations.	<ol style="list-style-type: none"> 1. Calculus, by George Thomas. Any Edition. 2. Essentials of Probability & Statistics for Engineers & Scientists, by Walpole, Myers, and Ye, Publisher: Pearson, 2013. 3. G. Fiche & G. Hébuterne, "Mathematics for Engineers", 1st Ed., John Wiley & Sons, Inc., 2007.
7	Information Systems and Database	14	The role of information systems in business today, how information systems are transforming business, what is an information system? How Information Technology Improves Business Processes, Types of Information Systems (TPS, MIS, DSS, and Business Intelligence), Multi-dimensional data insertion, Entropy of data in information systems, Information system management, Queuing models of information system. Database System Concepts & Relational Database System, Database Design & Database Architecture, SQL & Formal Relational Query Language, Database Storage & Recovery, Indexing & Hashing Techniques, Transactions & Concurrency Control.	<ol style="list-style-type: none"> 1. Management Information Systems, K. C. Laudon & J.P.Laudon, Prentice Hall, 13th Ed, 2014. 2. A. Silberschatz, H. Korth and S. Sudarshan, Database System Concepts, 7th Edition, Mc-Graw Hill, 2020. 3. Elmasri and Navathe, Fundamentals of Database Systems, 6th Edition, Addison-Wesley, 2011.
Total		100		

مواد الامتحان التنافسي للمتقدمين على الدراسات العليا في كلية هندسة المعلومات للعام الدراسي ٢٠٢٤/٢٠٢٥

٣- المواد المطلوبة للامتحان التنافسي للقبول بدراسة الماجستير في قسم هندسة شبكات الحاسوب:

No.	Subject	Marks	References	Chapters
1	Data Communications	15	William Stallings, Data and Computer Communications. 8th Edition, 2007.	3,4,5,6,7,8,9.
2	Computer Networks	20	James F. Kurose and Keith W. Ross, Computer Networking, A Top Down Approach, 6th Edition, 2013.	2,3,4,5,6.
3	Information and Network Security	20	William Stallings, Network Security Essentials, Applications and Standards, 6th Edition, 2017.	2, 3, 4, 8,9, 10.
4	Probability and Statistics, Information Theory and Coding	15	Douglas C. Montgomery, George C. Runger, Applied Statistics and Probability for Engineers, 3rd Edition, 2003.	1,2,3,4,5.
			Jorge C. Moreira, Patrick Guy Farrell, Essentials of Error-Control Coding, 2006	1,2.
5	Signals and Systems, Digital Signal Processing	15	Signals and Systems, Hwei P. Hsu, Ph.D. McGraw-Hill.2011.	1,2,5,6.
6	Computer Architecture and Microprocessor	15	William stalling, "Computer organization and architecture", 8th edition.	3,4,5,6,7,8,9.
Total		100		

٤- المواد المطلوبة للامتحان التنافسي للقبول بدراسة الماجستير في قسم هندسة المنظومات:

No.	Subject	Marks	References	Chapters
1	Computer Architecture & Microprocessor	20	Computer Organization and Architecture 10th - William Stallings: chapter 3,4,5,7	- Computer components: Bus/ Memory/ CPU - Instruction Fetch and Execute, instruction interrupt - Memory error correction, hamming code - Input / Output(I), external devices, I/O modules, DMA - Cache memory: computer memory system, cache memory principles, elements of cache design. Replacement algorithm, cache mapping function. - CPU architecture: arithmetic and logic unit, integer arithmetic.
2	Intelligent Systems	20	Lecture notes, and Introduction to soft computing, Eva Volna.	Ch2, Ch3, Ch4.
3	Control Engineering	20	Modern Control Engineering, Ogata, Fifth Edition, 2010.	Ch2 (2-1 to 2-6), Ch3, Ch5(5-1, 5-2, 5-6, 5-8), Ch6(6-1, 6-2, 6-3, 6-5), Ch7 (7-1, 7-2), Ch8(8-1, 8-2), Ch9(9-1, 9-2).
4	Digital Signal Processing	20	Signal processing principles, algorithms and Applications, John. G. Proakis Fourth Edition.	Ch1, Ch2, Ch3.
5	Mathematics and Engineering Analysis	20	Text Book: Thomas & Finney , Calculus & Analytic Geometry Edition & year public: Pearson Education Inc,11th Ed 2008 Text Book : Advanced Engineering Mathematics. Author : Erwin Kreyszig, Edition & Year Public: 9th Edition 2006.	Ch1, Ch2, Ch3 Ch4, Ch5, Ch6 Ch7. Part A, B, C and D.
Total		100		

مواد الامتحان التنافسي للمتقدمين على الدراسات العليا في كلية هندسة المعلومات للعام الدراسي ٢٠٢٤/٢٠٢٥

٥- المواد المطلوبة للامتحان التنافسي للقبول بدراسة الدبلوم العالي المعادل للماجستير في قسم هندسة المنظومات:

No.	Subject	Marks	References	Chapters
1	Engineering Mathematics	20	Advanced Engineering Mathematics 10th Edition, Erwin Kreyszc.	Required Chapter: 1 and 2.
2	Programming Techniques	20	Notes on Data Structures and Programming Techniques 2020, James Aspnes.	Required Chapter: 4 and 5.
3	Information Technology	20	Comer, Douglas E. The Internet Book. 5th ed. CRC Press, Taylor & Francis Group, 2019. ISBN: 978-1-138-33133-4.	Required Chapters: 19, 20, 21, 24, 30.
			William stalling, Operating systems: Internal & Design principles.7th Ed. By, 2012.	Required Chapter: 2.
4	Communications and Networks	20	Introduction to Networks and The Internet, Protocol Architecture, The TCP/IP protocol Architecture, The OSI model, Analog and Digital Signals Transmission, Channel capacity, Digital Data Analog Signals.	William Stallings, “ Data & Computer Communication “, 8th Ed. Chapter-1 (1.4 & 1.5) P.22-29 Chapter-2 (2.1, 2.2, & 2.3) P.33-43 Chapter-3(3.2 P.80-85 & 3.4 P.91-94) Chapter-5 (5.2 P-151-161).
5	Digital systems	20	1- Digital Design. Author: M. Morris Mano & D. Michael. 2- Digital Fundamentals. Author: Thomas L. Floyd.	Memory, Flip-flops, Excitation tables, Counters (Ring, Ripple counter, Binary counters, Asynchronous, Synchronous), Registers, Shift registers, clocked Sequential circuits, State tables, State diagram, State equations.
Total		100		