

الامتحان التنافسي / الدراسات العليا

للعام الدراسي 2021-2022



وزارة التعليم العالي والبحث العلمي

جامعة الموصل

كلية علوم الحاسوب والرياضيات

قسم البرمجيات

Master Study

Subject and Contents	Books
Software Engineering	
<ul style="list-style-type: none">❖ Software quality assurance<ul style="list-style-type: none">• Software quality management• Software quality models• Software quality measurement• Software testing-strategies• Software testing-implementation❖ Software development techniques<ul style="list-style-type: none">• Software development life cycle(system phases: requirements, design, coding, testing, maintenance)• Software development process models• Characteristics of good software❖ Software Project Management<ul style="list-style-type: none">• Project management concepts• Process and project metrics• Estimation for software projects• Project scheduling• Risk management❖ Software requirements<ul style="list-style-type: none">• Benefit of requirement engineering• Characteristic of good requirements• Types of requirements• Quality and metrics in requirement engineering• Requirement engineering artifact modeling• Eliciting tracing• Software requirement tools	<p>Software Engineering A Practitioners Approach, 7th edition 2010 ,- Roger S Pressman</p>

Artificial Intelligent Technique		
<ul style="list-style-type: none"> • Genetic Algorithms • Artificial Neural Networks: <ul style="list-style-type: none"> -Perceptron -Backpropagation • Fuzzy Logic • Swarm Intelligence <ul style="list-style-type: none"> -Particle Swarm Optimization (PSO) -Ant Colony Optimization (ACO) • Expert Systems 		<ul style="list-style-type: none"> - George F. Luger, <i>Artificial Intelligence: Structures and Strategies for Complex Problem Solving</i>. 6th ed. 2009 - Franz Rothlauf, <i>Representations for Genetic and Evolutionary Algorithms</i>. Springer, 2006 - William Siler and James J. Buckley, <i>Fuzzy Expert Systems and Fuzzy Reasoning</i>. JOHN WILEY & SONS, INC. 2005
Programing language		
<ul style="list-style-type: none"> ❖ Matlab Programming Language ❖ OOP Programming with java <ul style="list-style-type: none"> • Class: nested class • Inheritance • Using super keyword • Packages • Interfaces • Method overriding • Exploring java.io ; File • Exploring java.io ; Directories ❖ C++ Programming Language ❖ Web programming language 		<p>Peter I. Kattan, MATLAB for beginners, A Gentle approach Revised Edition, 2009 PeterI. Kattan</p> <p>Object Oriented program with Java by Simon Kendal</p> <p>C++ from control structures through objects</p> <p>HTML & CSS design and build websites, Jon Ducket Beginning Php, Matt Doyle CSS Note for Professionals, CSS group(s) or company(s).</p>
Operating systems		
<ul style="list-style-type: none"> • Processes • Threads • CPU scheduling • Process synchronization • Deadlocks • Memory management and virtual memory • Mass-storage and file system • Introduction to real time systems • Rate monotonic scheduling • EDF scheduling • Resource Access Protocols 		<p>Operating Systems concepts by Abraham Silberschatz, Peter Bear Galvin, Greg Gagne. 9th ed., 2013</p> <p>Real time computing systems by Giorgio Buttazzo , 3rd Edition</p>

Information Technology		
<ul style="list-style-type: none"> ❖ Data Structure and Algorithm ❖ Data representation ❖ Linked Structures ❖ Advanced Linked Lists ❖ Tree data structure ❖ Binary Trees ❖ Search Trees ❖ Graph data structure ❖ Recursion <ul style="list-style-type: none"> ❖ Information Security • Classical Encryption Techniques • Symmetric and Asymmetric Techniques • Principals of Information Hiding • Security Attack, Security Mechanisms, and Security services • Message Authentication • Computer Viruses <ul style="list-style-type: none"> ❖ Data Base ❖ The Database Environment ❖ The Database Development Process ❖ Modeling Data in the Organization ❖ The Enhanced E-R Model and Business Rules ❖ Logical Database Design and the Relational Model ❖ Normalization ❖ Client/Server Database 		<p>Data Structures and Algorithms in Python, Michael T. Goodrich, John Wiley & Sons.</p> <p>"Cryptography and Network Security: Principles and Practice", William Stallings (7th Ed.), Prentice-Hall, Inc., 2016.</p> <p>Modern Database Management, Jeffrey A. Hoffer, Mary B. Prescott, Fred R. McFadden</p>
Image Processing		
<ul style="list-style-type: none"> • Digital Image Representation • Discrete Fourier transformation • Properties of 2D Fourier transform • Fast Fourier transform • Enhancement methods • Image Compression (Lossless and Lossy Compression) • Image segmentation & Edge detection • Structure of special digital signal processors • Linear system 		<p>"Digital Image Processing", Rafael C. Gonzalez, Addison-Wesley Publishing Company, Inc.</p> <p>"Fundamentals of Digital Signal Processing", LONNIE C. LUDEMAN.</p>

Diploma Study

Subject	Books
Software Engineering	
<ul style="list-style-type: none"> • Principles of software engineering • Software development Paradigms • Software Management • Software Requirement • Software Testing • Software Maintenance 	<p>Software Engineering A Practitioners Approach, 7th edition 2010 ,- Roger S Pressman</p>
Artificial Intelligent	
<ul style="list-style-type: none"> • Problem Solving • Blind Search • Heuristic search • Knowledge representation • Expert systems • Natural Language Processing • Genetic Algorithms (Basics) 	<p>-George F. Luger, <i>Artificial Intelligence: Structures and Strategies for Complex Problem Solving</i>. 6th ed. 2009</p> <p>- Franz Rothlauf, <i>Representations for Genetic and Evolutionary Algorithms</i>. Springer, 2006</p> <p>William Siler and James J. Buckley, <i>Fuzzy Expert Systems and Fuzzy Reasoning</i>. JOHN WILEY & SONS, INC. 2005</p>
Programing language	
<ul style="list-style-type: none"> • Prolog Language • Java programming language • C++ language 	<p>Paul M.Chirlian, Turbo Prolog: An introduction, Prentice Hall PTR. 1988.</p> <p>programming with Java by Simon Kendal</p> <p>Programming with C++ “C++ from control structures through objects”, Tony Gaddis</p>

Computer architecture and operating systems

- ❖ General computer architecture
- ❖ Storage media
- ❖ I/O devices and structure
- ❖ Kinds of operating systems
- ❖ Process management
- ❖ CPU scheduling
- ❖ Threads
- ❖ Deadlocks
- ❖ Storage management

Operating Systems concepts by
Ibrahim Silberschatz

Information Technology

❖ Data Structure and Algorithm

- ❖ Abstract Data Types
- ❖ Array Structure
- ❖ Stacks
- ❖ Queues
- ❖ Searching and Sorting

Data Structures and Algorithms in
Python, Michael T. Goodrich, John
Wiley & Sons.

❖ Data Security

- Classical Encryption Techniques
- Symmetric and Asymmetric Techniques
- Principles of Information Hiding

"Cryptography and Network
Security: Principles and Practice",
William Stallings (7th Ed.),
Prentice-Hall, Inc., 2016.

❖ Data base

- ❖ Fundamentals of data base
- ❖ Entity-Relationship model
- ❖ Enhanced Entity-Relationship Model
- ❖ Normalization
- ❖ Data base design

Modern Database Management,
Jeffrey A. Hoffer, Mary B.
Prescott, Fred R. McFadden