كليه العلوم

قسم الذكاء الاصطناعي

مفردات المواد النظري

2025-2024

المرحلة الاولى- الفصل الدراسي الاول

1-البرمجة الاساسيه

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	• Introduction, Procedural Programming Principles • Introduction to algorithm • Algorithms example
Week 2	• Flowchart definition and its symbols • Flowchart examples
Week 3	• C++ programming language • Structure of C++ program • Reserved words and Header files • Character set and Identifiers • Variable and Constant • Data type (int , float , char , void) • Cout , Cin

Week 4	• Constant • % operator • IF statement • Compound IF statement • IF / ELSE statement
Week 5	**Quizzes**
Week 6	• && , || with if statement • ELSE IF statement
Week 7	• Switch statement • Nested switch statement
Week 8	• C++ operators : Arithmetic , Assignment ,Comparison ,Logical • Operators precedence
Week 9	• Unary operators (++ , --) • Prefix ,Postfix notation
Week 10	• Examples of order evaluation • "math.h" library : Exp,Log,Sin, Cos,Tan,Pow,Sqrt
Week 11	• While statement
Week 12	• Do / While statement
Week 13	• For loop statement
Week 14	**Midterm Exam**
Week 15	**Preparatory Week**
Week 16	**Final Exam**

2-الرياضيات

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	➢ Mathematical background ➢ Matrix Types of matrix, Matrix addition, subtraction, and multiplication, Determinant, transpose, and rank of matrix
Week 2	Inverse of matrix, absolute value,
Week 3	➢ Functions , Function Definition, Domain and range of functions and polynomials,
Week 4	➢ Derivation Mathematical definition of derivation, rule of derivation Derivation of trigonometric, inverse trigonometric, logarithm, exponential.
Week 5	➢ Series
Week 6	➢ Integration Indefinite integral, Rules of integral.
Week 7	Method of integration
Week 8	Partial derivative Partial derivative of two variables, total differential.
Week 9	Differential equations First order differential equations Variable separable, homogeneous differential equation
Week 10	Exact differential equation, first order linear differential equation.
Week 11	➢ Second order differential equation ➢ Homogeneous second order with constant coefficient, non Homogeneous second order with constant coefficient.
Week 12	Variation of parameter

Week 13	Laplace transformation Definition, Laplace transformation of some function, Laplace transformation of differential Properties of L.T (3) Shifting (4) L.T of integrals (5) Multiplication by t^n.
Week 14	Inverse laplace transformation Properties of inverse L.T 2- Partial fraction
Week 15	3- Application of Laplace transformation 4- Linear(D.E) with constant coefficient.

3-الاحصائيات والاحتمالات

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Population ,samples , type of samples, Random variables discrete variable, continuous variable, Data Organization.
Week 2	frequency distribution, histogram
Week 3	measurement of central tendency - mean ,median, mode.
Week 4	measurements of variation -standard deviation, variance ,coefficient of variation
Week 5	Probability Theory -sample space, events ,rules of probability, Venn Diagram.
Week 6	tree diagram, probability theorems -Addition theorem.
Week 7	Mid-term Exam
Week 8	Multiplication theorem.
Week 9	Counting techniques :Factorial, Permutations, Combinations ,Conditional probability
Week 10	Bayes theorem, Independent of events, Discrete Probability distributions.
Week 11	Binomial distribution, Multinomial distribution.
Week 12	Poisson distribution, Continuous Probability Distributions-Uniform distribution.
Week 13	Normal distribution, Exponential distribution.
Week 14	Correlation and Regression.
Week 15	**Preparatory Week**
Week 16	**Final Exam**

4-تنضيم الكمبيوتر والتصميم المنطقي

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction to computer architecture , Computer definition, History of computer , Application with computer system
Week 2	Computer classification [analog, digital, h• Input units, Output units ybrid], Main parts of a personal computer, Hardware: the structure of computer system ,

Week 3	Central processing units [CPU] , CPU components [ALU,RS,CU], CPU operations , Main memory, Primary storage, Type of main memory [RAM,ROM] Instruction format with memory , Secondary storage , Type of secondary storage
Week 4	Software Programs and application programs and utilities , System software and operating system and utilities ,Application packages.
Week 5	Software Programs and application programs and utilities ,System software and operating system and utilities, Application packages.
Week 6	➢ Number system • Decimal. Binary • Octal. • Hexadecimal
Week 7	➢ Addition and subtraction • binary • octal • Hexadecimal.
Week 8	➢ Logic gates. ➢ Boolean algebra and simplification and demorgan's
Week 9	➢ K-map. ➢ Combinational universal NAND and NOR logic.
Week 10	➢ Half-adder ➢ full-adder ➢ 4- bit parallel adder, and Subtract adder.
Week 11	➢ Decoder, encoder ➢ Multiplexer, and DE multiplexer.
Week 12	➢ Sequential logic circuits and Flip-flop, SR, D, and JK flip-flop.
Week 13	➢ Shift register 3-bit and 4-bit.
Week 14	➢ Binary counter 3-bit and 4-bit.
Week 15	**Preparatory Week**
Week 16	**Final Exam**

5-مبادئ الذكاء الاصطناعي

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	AI definition, history, concept, and applications
Week 2	AI goals and AI environment
Week 3	Alan Turing Test
Week 4	Data-Information-Knowledge (DIK Hierarchy)
Week 5	Knowledge base building
Week 6	Knowledge discovery, Knowledge acquisition
Week 7	Knowledge engineering. Knowledge representation
Week 8	Problem fundamentals and characteristics

Week 9	Problem state space
Week 10	Problem solving approach
Week 11	Problem solving approach
Week 12	Different problems in AI world
Week 13	Shortest path problem. Travelling salesman problem
Week 14	2 jug problem, Monkey and banana problem
Week 15	**Preparatory Week**
Week 16	**Final Exam**

المرحلة الاولى- الفصل الدراسي الثاني

1-برمجة الهيكل

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي للنظري	
	Material Covered
Week 1	• **Functions, program in functions** • **Passing parameters**
Week 2	• **Arrays: one dimensional array**
Week 3	• **Arrays: two dimensional array**
Week 4	• **Array and functions**
Week 5	**Quizzes**
Week 6	• **Strings**
Week 7	• **Member function of strings**
Week 8	• **Structure : Type of Structure declaration**
Week 9	• **Array of Structures**

Week 10	• **Structure within structure** • **Functions and structures**
Week 11	• **pointers declaration** • **pointers and functions parameters passing**
Week 12	• **Pointers and arrays**
Week 13	• **Arrays of pointers** • **pointers to pointers**
Week 14	**Midterm Exam**
Week 15	**Preparatory Week**
Week 16	**Final Exam**

2-هياكل منفصلة

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	**Set theory-sets & subsets, how to specify sets, operations on sets,**
Week 2	**Algebra of sets and its proves, Power set, Classes of sets, Cardinality.**
Week 3	**Sets of numbers, Finite sets and counting principle**
Week 4	**Mathematical induction**
Week 5	**Computer representation of relations and Digraph, Manipulation of relations.**
Week 6	**Properties of relations, Composition of relations**
Week 7	**Type of function (one-to-one & invertible function), Geometrical characterization of Functions**
Week 8	**Mid Exam**
Week 9	**Sequences of sets, Recursively defined functions, Definition, Graphs. Sub graph, and Multigraphs**
Week 10	**Degree of graph, Connectivity, Special graph, Walk & length of walk, Trail, path, cycle**
Week 11	**The bridges of Konigsberg, Traversable multigraphs, Labeled graphs, Minimal path, Minimum spanning tree**
Week 12	**Matrices and graph, Trees, rooted tree, ordered rooted tree, polish notation, with examples**
Week 13	**Finite state machines: Finite automata**
Week 14	**Optimistic approach to construct FSM, Deterministic Finite state automata**
Week 15	**Preparatory Week**
Week 16	**Final Exam**

3-التصميم المنطقي

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction to computer architecture , Computer definition, History of computer , Application with computer system
Week 2	Computer classification [analog, digital, h• Input units, Output units ybrid], Main parts of a personal computer, Hardware: the structure of computer system ,
Week 3	Central processing units [CPU] , CPU components [ALU,RS,CU], CPU operations , Main memory, Primary storage, Type of main memory [RAM,ROM] Instruction format with memory , Secondary storage , Type of secondary storage
Week 4	Software Programs and application programs and utilities , System software and operating system and utilities ,Application packages.
Week 5	Software Programs and application programs and utilities ,System software and operating system and utilities, Application packages.
Week 6	➢ Number system • Decimal. Binary • Octal. • Hexadecimal
Week 7	➢ Addition and subtraction • binary • octal • Hexadecimal.
Week 8	➢ Logic gates. ➢ Boolean algebra and simplification and demorgan's
Week 9	➢ K-map. ➢ Combinational universal NAND and NOR logic.
Week 10	➢ Half-adder ➢ full-adder ➢ 4- bit parallel adder, and Subtract adder.
Week 11	➢ Decoder, encoder ➢ Multiplexer, and DE multiplexer.
Week 12	➢ Sequential logic circuits and Flip-flop, SR, D, and JK flip-flop.
Week 13	➢ Shift register 3-bit and 4-bit.
Week 14	➢ Binary counter 3-bit and 4-bit.
Week 15	**Preparatory Week**
Week 16	**Final Exam**

4-لغة البرولوج

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Introduction on Prolog language**
Week 2	**Facts, rules, and variables**
Week 3	**Questions types**
Week 4	**Interdependence and retrieval**
Week 5	**Built-in Boolean and Mathematical Functions**
Week 6	**programming examples of read and write functions**
Week 7	**Cut & Fail functions**
Week 8	**Repeat & Recursion**
Week 9	**Tail & non- Tail Recursion**
Week 10	**String in Prolog**
Week 11	**List in Prolog**
Week 12	**Database in Prolog**
Week 13	**Database in Prolog**
Week 14	**Files in Prolog**
Week 15	**Preparatory Week**
Week 16	**Final Exam**

5-طرق تمثيل المعرفة

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	KR fundamentals and types
Week 2	Why we need to KR?
Week 3	Propositional logic
Week 4	Predicate logic
Week 5	Clause form
Week 6	Resolution theorem proving
Week 7	Resolution theorem proving

Week 8	Semantic networks
Week 9	Conceptual graph
Week 10	Frames
Week 11	Script
Week 12	Production rules
Week 13	The AND-OR graph
Week 14	Monotonic Logic and non-monotonic logic
Week 15	**Preparatory Week**
Week 16	**Final Exam**