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| **Delivery Plan (Weekly Syllabus)**المنهاج الاسبوعي النظري |
|  | **Material Covered** |
| **Week 1** | * General information about Computation.
* Representing Information.
* Computational Problems.
* Characteristics of computational problems
* Theory of computation
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| **Week 2** | * Language Concepts
* Grammar Concepts
* Chomsky Classification of Grammars
* Finite State Machine
* How does a Automaton work ?
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| **Week 3** | * Machine view of FA
* How to define a FA
* FA diagrams
* Characteristics of state machine
* Deterministic finite automaton DFA
* Examples of DFA .
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| **Week 4** | * Non deterministic Finite State Machine (NFA)
* NFA operation
* Examples of NFA
* DFA Vs. NFA
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| **Week 5** | * Equivalence of Machines
* Example of equivalent machines
* Proof by construction
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| **Week 6** | * Properties of Regular Languages
* Definition (Regular Languages)
* Union Operation & Examples
* Concatenation Operation & Examples
* Star Operation & Examples
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| **Week 7** | * Reversal Operation & Examples
* Complement Operation & Examples
* Intersection Operation & Examples
* De Morgan’s Law & Example
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| **Week 8** | * DFA Minimization
* Equivalence theorem.
* Draw the equivalent DFA
* Minimization of DFA Table Filling Method
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| **Week 9** | * Myhill-Nerode Theorem
* Regular Languages & examples
* Regular Expression & examples.
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| **Week 10** | * automata theory ( Basics , Inductions

, Precedence of Operators , Examples , Identities , Facts )* Equivalence of RE’s and Automata .
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| **Week 11** | * Converting a RE to an ε-NFA
* Form of ε-NFA s Constructed
* RE to ε-NFA : ( Union, Concatenation, Closure, Examples)
* DFA to RE
* Algebraic Laws for RE’s
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| **Week 12** | * Convert Automata into RegEx using State Elimination
* pumping Lemma
* Theorem to Proof Language is Regular
* Theorem to Proof Language is Not Regular
* Pigeonhole Principle and FSA
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| **Week 13** | * Theorem – Long Strings
* Line of Reasoning
* Examples of Pumping Lemma
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| **Week 14** | * Context Free Grammar
* FSM Summary
* Context-Free Languages
* Chomsky Hierarchy
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| **Week 15** | * Derivation of Context-Free Languages
* Derivation Trees , Examples
* Ambiguity , Examples .
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| **Week 16** | **Preparatory week before the final Exam** |