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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 |
| **Week 2** | * Language Concepts * Grammar Concepts * Chomsky Classification of Grammars * Finite State Machine * How does a Automaton work ? |
| **Week 3** | * Machine view of FA * How to define a FA * FA diagrams * Characteristics of state machine * Deterministic finite automaton DFA * Examples of DFA . |
| **Week 4** | * Non deterministic Finite State Machine (NFA) * NFA operation * Examples of NFA * DFA Vs. NFA |
| **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 |
| **Week 7** | * Reversal Operation & Examples * Complement Operation & Examples * Intersection Operation & Examples * De Morgan’s Law & Example |
| **Week 8** | * DFA Minimization * Equivalence theorem. * Draw the equivalent DFA * Minimization of DFA Table Filling Method |
| **Week 9** | * Myhill-Nerode Theorem * Regular Languages & examples * Regular Expression & examples. |
| **Week 10** | * automata theory ( Basics , Inductions   , Precedence of Operators , Examples , Identities , Facts )   * Equivalence of RE’s and Automata . |
| **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 |
| **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 |
| **Week 13** | * Theorem – Long Strings * Line of Reasoning * Examples of Pumping Lemma |
| **Week 14** | * Context Free Grammar * FSM Summary * Context-Free Languages * Chomsky Hierarchy |
| **Week 15** | * Derivation of Context-Free Languages * Derivation Trees , Examples * Ambiguity , Examples . |
| **Week 16** | **Preparatory week before the final Exam** |