Lecture Title: Propositional Logic and Resolution in Propositional Logic.

* **Propositional Logic**

“Water is liquid” true.
“Today is Monday” true.
“It is raining now” true.

* **Connectives**

AND $\land$

OR $\lor$

NOT $\neg$

IMPLIES $\Rightarrow$

EQUAL $=$

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<tr>
<th>$P$</th>
<th>$Q$</th>
<th>$P \land Q$</th>
<th>$P \lor Q$</th>
<th>$\neg P$</th>
<th>$P \Rightarrow Q$</th>
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Sentences formed by these connectives are called well formed formulas (wff). Brackets of the form (, ), [, ], {, } can be used to group symbols into sub expressions and thus control the order of evaluation, for example (P ∨ Q)=R and P ∨ (Q=R).

* Common Identities in Propositional Logic

1- ¬(¬P) ≡ P.
2- (P ∨ Q) ≡ (¬P → Q).
3- ¬(P ∨ Q) ≡ (¬P ∧ ¬Q).
4- ¬(P ∧ Q) ≡ (¬P ∨ ¬Q).
5- P ∨ (Q ∧ R) ≡ (P ∨ Q) ∧ (P ∨ R).
6- P ∧ (Q ∨ R) ≡ (P ∧ Q) ∨ (P ∧ R).
7- P ∧ Q ≡ Q ∧ P.
8- P ∨ Q ≡ Q ∨ P.
9- (P ∧ Q) ∧ R ≡ P ∧ (Q ∧ R).
10- (P ∨ Q) ∨ R ≡ P ∨ (Q ∨ R).
11- P → Q ≡ ¬P ∨ Q. (Important).