

# Phil 120, Review Notes

Stuff

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1   References

1.1   BasicLogic Operators

The followings are for  $A * B$ , where '\*' is an operator, A is top row, B is left column.

$\wedge$	T	F	AND. Conjunction. $A \wedge B$ is true only when both A and B are true.
T	T	F	
F	F	F	
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$\vee$	T	F	OR. Disjunction. $A \vee B$ is true when either A or B, or Both are true.
T	T	T	
F	T	F	
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$\rightarrow$	T	F	IMPLIES. If A then B. A implies B. A implies B is true when A is true and B is true, or when A is false. Note: $A \rightarrow B = \neg A \vee B$
T	T	T	
F	F	T	
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$\leftrightarrow$	T	F	IFF, A if and only B. A is logically equivalent, two way implication. $A \leftrightarrow B$ is true exactly when the truth value of A is the same as B. Note: $A \leftrightarrow B = (A \rightarrow B) \wedge (B \rightarrow A) = (A \wedge B) \vee (\neg A \wedge \neg B)$
T	T	F	
F	F	T	

1.2   Some Logic Identities

$A \vee \neg A = T$	Excluded Middle, either A or not A must be true.
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$\neg(A \wedge \neg A)$	Non-contradiction. It is true that not both A and not A hold at the same time.
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$A \rightarrow B, A \implies B$	Modus ponenes, to prove. If A implies and B and A is true, then B is true.
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$A \rightarrow B, \neg B \implies \neg A$	Modus tollens, to disprove. If the conclusion is false, then the premise is false also.
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$A \vee B, \neg A \implies B$	Disjunctive syllogism. If at least one of A or B is true, then if one of them is false, the other must be true.
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$(A \rightarrow B) \iff (\neg B \rightarrow \neg A)$	Contrapositive. Similar to Modus tollens.
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$A, \neg A \implies B$	Explosion. From a false premise you can arrive at any conclusion.
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$\neg(A \vee B) \iff \neg A \wedge \neg B$ $\neg(A \wedge B) \iff \neg A \vee \neg B$	De Morgan's Law.
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$A \vee (B \wedge C)$	