MA108: Information Packet

Logic

Precedence of Logic Operations

Operator	Precedence
~	1
^	2
v	3
→	4
↔	5

Negation Operation

p	$\sim p$
T	F
F	T

Conjunction (and) Operation

p	q	$p \wedge q$
T	T	T
T	F	F
F	T	F
F	F	F

Disjunction (or) Operation

p	q	$p \vee q$
T	T	T
T	F	T
F	T	T
F	F	F

Conditional (if, then) Statement

p	q	$p \rightarrow q$
T	T	T
T	F	F
F	T	T
F	F	T

Biconditional (if and only if) Statement

p	q	$p \leftrightarrow q$
T	T	T
T	F	F
F	T	F
F	F	T

De Morgan's Laws

$$\sim(p \wedge q) \equiv \sim p \vee \sim q$$

$$\sim(p \vee q) \equiv \sim p \wedge \sim q$$

Variations of Conditional Statement

Name	Symbolic Form	English Translation
Conditional	$p \rightarrow q$	If p, then q
Converse	$q \rightarrow p$	If q, then p
Inverse	$\sim p \rightarrow \sim q$	If not p, then not q
Contrapositive	$\sim q \rightarrow \sim p$	If not q, then not p
Negation	$p \wedge \sim q$	p and not q