Phil 225 -- Symbolic Logic
Sentential Logic
Rules of Inference

CE: $\dfrac{A \wedge B}{A}$, $\dfrac{A \wedge B}{B}$ **CI**: $\dfrac{A, B}{A \wedge B}$

DE$_1$: $\dfrac{(A \vee B), - A}{B}$ $\dfrac{(A \vee B), - B}{A}$ $\dfrac{(- A \vee B), A}{B}$ $\dfrac{(A \vee - B), B}{A}$

DE$_2$: $\dfrac{A \vee B, (A \rightarrow C), (B \rightarrow C)}{C}$ **DI**: $\dfrac{A}{A \vee B}$, $\dfrac{B}{A \vee B}$

NE: $\dfrac{- - A}{A}$ **NI**: $\dfrac{A}{- -A}$

BE: $\dfrac{A \leftrightarrow B, A}{B}$ $\dfrac{A \leftrightarrow B, B}{A}$ $\dfrac{A \leftrightarrow B, - A}{- B}$ $\dfrac{A \leftrightarrow B, - B}{- A}$ $\dfrac{- A \leftrightarrow B, A}{- B}$ $\dfrac{A \leftrightarrow - B, B}{- A}$

BI: $\dfrac{(A \rightarrow B), (B \rightarrow A)}{A \leftrightarrow B}$ **MP**: $\dfrac{A, (A \rightarrow B)}{B}$ **MT**: $\dfrac{(- A \rightarrow - B), B}{A}$

C: $\dfrac{A}{B \rightarrow A}$ You may eliminate the line number on which B occurs (as a premise)

RAA: $\dfrac{B \wedge - B}{A}$ You may eliminate the line number on which –A appears

$\dfrac{B \wedge - B}{- A}$ You may eliminate the line number on which A appears

R: replace B by B' in any WFF where B ↔ B' is a previously proved theorem.

TH: $\dfrac{A_1, A_2, \ldots A_n}{B}$ where $A_1 \rightarrow (A_2 \rightarrow \ldots(A_n \rightarrow B)\ldots))$ is a previously proved theorem.

P: take A as a premise; premise number is line number

D: replace definitionally equivalent WFFs inside WFFs

A ∨ B eq. – A → B
A ∧ B eq. – (A → –B)
A ↔ B eq. (A → B) ∧ (B → A)