Introduction to Mathematical Logic

For CS Students

CS104/CS108

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南方科技大学

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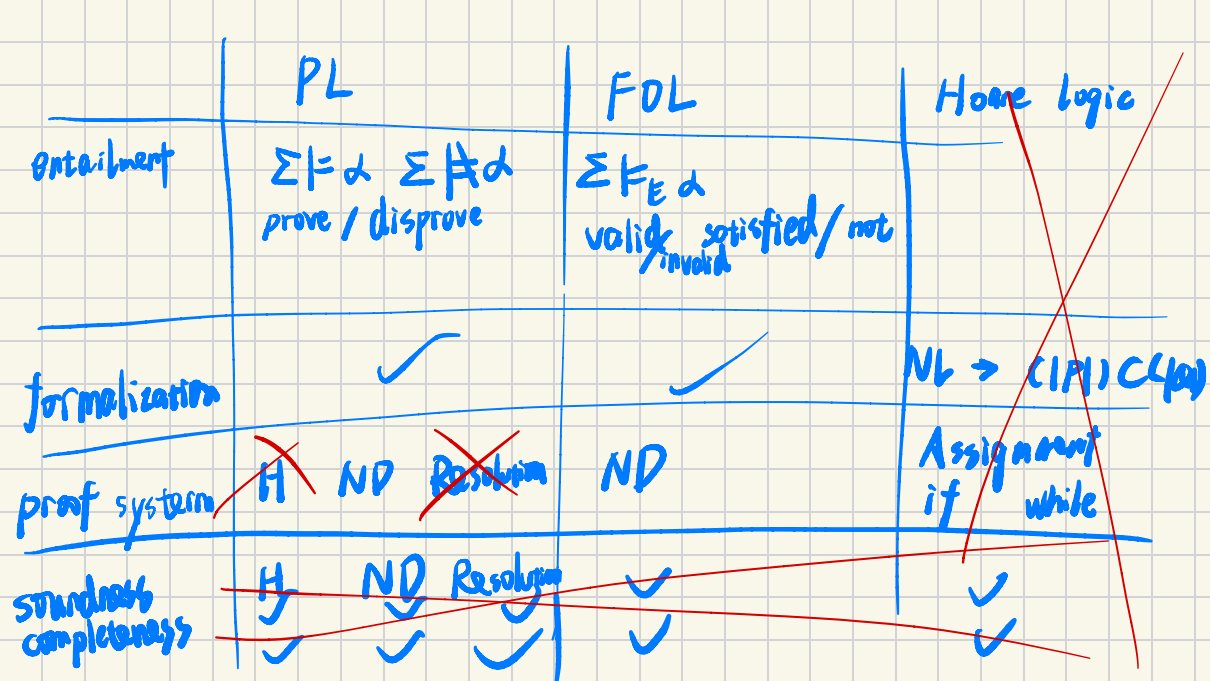
▶ Course Review

Main topics covered

1 Course Review

- Preliminaries (预备知识)
- Propositional Logic (经典命题逻辑)
- First-order Logic (经典一阶逻辑)
- Hoare Logic (霍尔逻辑)

	PL	FOL	Hoare Logic
Syntax	alphebat $\wedge \vee \rightarrow \neg \leftrightarrow$ wff convention, precedence	alphabet constant, predicate function $\forall x . \exists x$ convention term, atomic wff precedence	$(\|P\|)$ C $(\|Q\|)$
Semantics	truth value wff tautology, contradiction, satisfied logical equivalence $\equiv$ adequate set	Scope free bound variable interpretation, environment $\chi^{(I,E)} = 1/0$ wff $\forall x\alpha$ $E[x \mapsto d]$ $\exists x\alpha$	partial correctness fully


PL
FOL
Hoare logic
entailment
$\Sigma \models \alpha$ $\Sigma \not\models \alpha$
prove / disprove
$\Sigma \models_E \alpha$
valid / invalid satisfied / not
formalization
NL → CIPIC4pp
proof system
H ND Resolution
ND
Assignment
if while
soundness
completeness
H ND Resolution
ND
✓

Grading scheme

- Class participation & Quizzes: 20%
- Assignments: 30%
- Final exam: 50% (close-book, NO cheating paper)

Introduction to Mathematical Logic

Thank you for listening!
Any questions?