# OTE: Ohjelmointitekniikka
# Programming Techniques

*course homepage:* `http://www.cs.uku.fi/~mnykanen/OTE/`

Week 47/2008

Try to solve all exercises except 3 logically: by manipulating formulae using the wp axioms and the laws of propositional logic. If you must resort to semantic reasoning about program states instead, you can still mark yourself half a credit.

**Exercise 1.** Prove Theorem 8 (that wp is monotonic).

**Exercise 2.** Prove the forward ($\Longrightarrow$) direction of Theorem 9 (that wp distributes over '$\vee$').

**Exercise 3.** Prove the other ($\Longleftarrow$) direction of Theorem 9 (that wp distributes over '$\vee$').

**Exercise 4.** Prove Theorem 11 (strengthening the precondition).

**Exercise 5.** Prove Theorem 12 (weakening the postcondition).

**Exercise 6.** Prove that if $\{\ \phi\ \}S_1\{\ \varphi\ \}$ and $\{\ \varphi\ \}S_2\{\ \psi\ \}$ then also $\{\ \phi\ \}S_1; S_2\{\ \psi\ \}$.