



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Computability and Complexity

CSE 6321

Credit Hours:

3.00 - 3.00

Course Levels:

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Turing machines, decidability, recursive enumerability; many-to-one and polynomial-time reductions; NP-completeness, Cook-Levin Theorem; Recursion Theorem.

Prerequisites and Co-requisites:

Prereq: 3321 (625) or 5321.

Course Goals / Objectives:

- Master the use of reductions to prove certain problems undecidable
 - Master the use of polynomial time reductions to prove certain problems NP-complete
 - Be familiar with diagonalization
 - Be familiar with Church's Thesis
 - Be familiar with various complexity classes
 - Be familiar with the Cook-Levin Theorem
 - Be exposed to theory of cardinalities
 - Be exposed to approximation results for NP-complete problems
 - Be exposed to complexity class hierarchies
 - Be exposed to Savitch's Theorem
-

Course Topics:

- Theory of cardinalities.
 - Turing machines and variant models of computation.
 - Decidability, recursive enumerability.
 - NP-completeness.
 - Approximation algorithms for NP-complete problems.
 - Hierarchy theorems, Savitch's Theorem.
 - Advanced topics (such as the Recursion Theorem).
-

Designation:

Elective