



**1. New Syllabus of Record**

**I. Catalog Description**

COSC 460 Theory of Computation

3c-01-3cr

~~Prerequisite: COSC 310 or instructor permission~~

- b. Complement and Intersection
- c. Pumping Lemma

**Part II: THEORY OF FORMAL LANGUAGES**

- F. Context-free Grammars 5 hours
  - a. Define languages
  - b. Parse trees
  - c. The Total Language Tree of the CFG
  - d. Regular grammar
  - e. Ambiguity
  - f. Chomsky Normal Form
  - g. Derivations
- G. Pushdown Automata 5 hours
  - a. Building a PDA for a CFG
  - b. Building a CFG for a PDA
- H. Context-free languages 5 hours
  - a. Self embeddedness

- c. Closure properties
- d. Intersection and complement
- e. Finiteness, emptiness and membership

**Part III: THEORY OF TURING MACHINES**

- I. Turing Machines 4 hours
  - a. Define Turing machine
  - b. Post Machines
  - c. Simulating PM on a TM
  - d. Simulating TM on PM
- J. Variations of Turing Machines 3 hours
  - a. The k-track TM

- d. Decidability
- K. The Chomsky Hierarchy and Computers 3 hours

- a. Phrase structure grammar
- b. Type 0=TM
- c. Defining the computer
- d. Church thesis

Midterm Exams 2 hours

**Total = 42 hours**

VII. Required Textbook

Introduction to Computer theory, Second Edition, Daniel I.A. Cohen., John Wiley & Sons, Inc., New York, 1997

VIII. Special Resource Requirements

None.

IX. Bibliography

Davis, Ruth and E. Truth, Deduction, and Computation. New York: Computer Science Press, 1989.

Drobot, V. Formal Languages and Automata Theory. Rockville, MD: Computer Science Press, 1989.

~~Dworkitt, E. P. and Giardino, C. P. Mathematical Methods for Artificial Intelligence and Autonomous Systems. Englewood~~

Cliffs, NJ: Prentice Hall, 1988.

Floyd, R. W. and Beigel, R. The Languages of Machines: An Introduction to Computability and Formal Languages. New

York: Wiley, 1982.

York: Computer Science Press, 1994.

Gregory, Taylor R., Models of Computation, Oxford University Press, 1998.

Gurari, E. M. An Introduction to the Theory of Computation. New York: Computer Science Press, 1989.

Hein, James L., Theory of Computation, Jones & Bartlett, 1996.

**4. The old syllabus of record**

Does not exist. We are applying under the provision of Syllabus of Record Amnesty for expedited review.

**Part-III            Letters of Support or Acknowledgement**

Not applicable