CS 321 – Introduction to Theory of Computation

Catalog Description: Survey of models of computation including finite automata, formal grammars, and Turing machines.

Credits: 3 **Terms Offered:** Fall

Prerequisites: CS 261

Courses that require this as a prerequisite: CS 480

Structure: Three 50-minute lectures per week

Instructors: Alan Fern

Course Content:
- Regular languages,
- Context-free languages and
- Turing Machines

Measurable Student Learning Outcomes:
At the completion of the course, students will be able to…
1. **Convert** between finite automata, regular grammars, and regular expression representations of regular languages (Level 3; ABET Outcomes: A)
2. **Apply** the pumping lemma for regular languages to determine if a language is regular (Level 3; ABET Outcomes: B, J)
3. **Convert** between grammars and push-down automata for context-free languages (Level 3; ABET Outcomes: A)
4. **Determine** if a language is regular or context-free (Level 3; ABET Outcomes: B, J)
5. **Demonstrate** that a grammar is ambiguous (Level 3; ABET Outcomes: B, J)
6. **Translate** a context-free grammar from one form to another (Level 3; ABET Outcomes: A)
7. **Produce** simple programs for a Turing Machine (Level 3; ABET Outcomes: A)
8. **Explain** the concept of undecidability (Level 2; ABET Outcomes: B, J)
9. **List** examples of undecidable problems (Level 1; ABET Outcomes: B, J)

Learning Resources:
- An Introduction to Formal Languages and Automata by Peter Linz, Third Edition (required)

Students with Disabilities:
Accommodations are collaborative efforts between students, faculty and Services for Students with Disabilities (SSD). Students with accommodations approved through SSD are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through SSD should contact SSD immediately at 737-4098.

Link to Statement of Expectations for Student Conduct:

http://oregonstate.edu/admin/stucon/achon.htm

Revised: 8/14/07