CS-302 Theory of Computation
Syllabus

Course Information

Class Days:	Tuesday, Thursday
Class Time:	10:50 a.m. – 12:05 p.m.
Class Room:	PTC-301
Instructor:	Dr. Iyad A. Ajwa E-mail: iajwa@ashland.edu Office: PTC-203 Office Phone: 419.289.5798
Office Hours:	Monday – Friday: 8:15 a.m. – 9:00 a.m. and 12:00 noon – 1:00 p.m. Monday, Wednesday, Friday: 11:00 a.m. – 12:00 p.m. and 2:00 p.m. – 3:00 p.m. and by appointment.

Course Materials

- **Required Textbook:** Theory of Computing: A Gentle Introduction, By E. Kinber and C. Smith, ©2001 Prentice Hall, ISBN: 0-13-027961-7.

Course Description

An introduction to the logical and mathematical foundations of computer science. Topics discussed include models of computation, grammars and parsing, solvable and unsolvable problems, and P/NP complexity classes.

Student Outcomes

Theory of Computation is a computer science core course that demonstrates the logical and mathematical foundations of computer science and provides a context for this theory by using the ideas in some important applications. The course emphasis is on students gaining a thorough understanding of the mathematical concepts that recur through the curriculum. The main goals of the course are:

1. Students understand the different modules of computation: finite state automata, pushdown automata, and nondeterminism.
2. Students understand regular expressions and different types of grammars.
3. Students understand the application of grammars to parsing theory and computability.
4. Students are able to use different parsing methods and aspects of grammars that simplify parsing.
5. Students are able to identify solvable/unsolvable problems and distinguish P/NP complexity classes.

Student Assessment Criteria

Overall student performance will be assessed using homework assignments (30%), class tests (50%), and the final examination (20%).

- **Homework Assignments** will be assigned weekly. Homework assignments vary in length and complexity. They should be done by the announced deadlines. Late assignments will be penalized 20% for the first day and 10% per calendar day after that. No late homework assignments will be accepted once the graded assignment has been returned to the rest of the class. There will be no exceptions. It is your responsibility to do your work on time.

- **Class Tests:** Seven (7) in-class tests will be given during the course of the semester. Make-ups will be given if the student misses a test on the scheduled date for a legitimate reason **and** prior arrangements with the instructor are made. A make-up exam must be taken before the graded exam is returned to class. Below is a schedule for all class tests. Please note that dates of class tests are subject to change. Any changes will be announced in class.

TEST I:	Thursday	September 8, 2011
TEST II:	Thursday	September 22, 2011
TEST III:	Thursday	October 6, 2011
TEST IV:	Thursday	October 20, 2011
TEST V:	Thursday	November 3, 2011
TEST VI:	Thursday	November 17, 2011
TEST VII:	Thursday	December 1, 2011

- **The Final Examination** will be comprehensive. The following date and time of the Final Examination is announced by the Registrar's Office and cannot be changed except as outlined in the Student Handbook. Do not make any plans that would prevent you from taking the final exam at the scheduled time. All students must take the final exam.

  Saturday December 10, 2011 (1:30 p.m. – 3:30 p.m.)

- **Letter grades** will be assigned according to the following grading scale:
  (100 ≥ A ≥ 93) (93 > A- ≥90) (90 > B+ ≥ 87) (87 > B ≥ 84) (84 > B- ≥ 80) (80 > C+ ≥ 77)
  (77 > C ≥ 74) (74 > C- ≥70) (70 > D+ ≥ 67) (67 > D ≥ 64) (64 > D- ≥ 60) (60 > F ≥ 0)

- The Final Examination will be comprehensive. Below is a schedule for all exams given during the course of the semester. The date and time of the Final Examination are set in concrete and cannot be changed except as outlined in the Student Handbook. Do not make any plans that would prevent you from taking the final exam at the scheduled time. All students must take the final exam. Dates of in-class tests are subject to change. Any changes will be announced in class.

Course Guidelines

- **Teaching Methodology:** Material will be presented in class through lectures and assigned readings in the textbook. Class notes and miscellaneous material will be made available on Angel as appropriate. Students are encouraged to actively participate in class discussions. Homework assignments will be used to reinforce your understanding of the concepts presented. As with most computer science (and many other) classes, a substantial part of learning occurs outside of class. It is common to spend more than two hours studying outside of class for every hour spent in class. Find a study group to work with on a regular basis. You are encouraged to study for exams together and to discuss the problems on the homework assignments together. However, each student will write and submit their own solutions to the homework assignments.

- **Academic Integrity** is an important element of effective learning. All students are expected to read, understand, and follow the Academic Integrity Policy specified in the Ashland University Student Handbook. For exams, this means that students may not give or receive assistance on the exam (except from me). For graded homework assignments, students are permitted to work in groups and share information freely. However, copying another student's solution on individual assignments is a violation of the policy (and defeats the purpose of doing the assignments) and is not permitted. If you do not understand how to do an assignment, contact me by telephone or email or come by my office, and I will be happy to assist you in a way that

will increase your understanding of the assignment. Forms of academic dishonesty will be handled in accordance with University policy. The minimum punishment for plagiarism, cheating or other academic integrity violations is a zero on the exam or assignment on which the violation occurred. The maximum punishment is a grade of "F" for the course.

- **Student Accommodations:** Students with documented disabilities who require academic adjustments for this class are requested to contact me to discuss accommodations. While not required, it is in the best interest of the student to have this conversation early in the semester. In order to receive academic adjustments, paperwork from Disability Services must be provided to document this need. Disability Services is located in 105 Amstutz, extension 5953.
- **Course Outline:** The following is a tentative course schedule. Dates are subject to change.

Week	Topic	Reading Assignment
1	Basic Mathematical Concepts (4)	Chapter 1
2		
3	Alphabets and Languages (3)	
4	Finite State Automata (14)	Chapter 2
5		
6		
7		
8		
9	Context-Free Languages (11)	Chapter 3
10		
11		
12		
13	Turing Machines (6)	Chapter 4
14		
15		