CS580, Foundations  
Syllabus

Spring 2004  
Claxton 205, Tuesday/Thursday, 9:40 – 10:55 AM  
Class web page: http://www.cs.utk.edu/~parker/Courses/CS580-spring04

Instructor: Prof. Lynne E. Parker  
Office: Claxton Complex 220  
Email: parker@cs.utk.edu  
URL: http://www.cs.utk.edu/~parker  
Office Hours: Thursday, 11:00 – 12:00, or by appointment (send email)

TA:  
½-time:  
Chris Symons  
Office: Claxton Complex 347  
Email: symons@cs.utk.edu  
Office Hours: Mon., 3:30 – 5:00

Full-time:  
Ben Birch  
Office: Claxton Complex 125  
Email: birch@cs.utk.edu  
Office Hours: Mon., Wed., 11:00 – 12:00

Course Description:  
CS580 covers the foundations of computer science, including computability, computational complexity, algorithm analysis, and selected topics in algorithmic theory.

Prerequisites:  
Automata theory and mathematical maturity commensurate with the successful completion of CS380 or its equivalent.

Textbooks:  
• Required:  

• Not required, but helpful:  

Topics We’ll Study (refer to the class web site for a detailed schedule):

I. Formal Languages and Computability Theory. Finite automata, regular expressions, pushdown automata, context free grammars, pumping lemmas, Turing machines, Church-Turing thesis, decidability, halting problem, reducibility, etc.

II. Complexity Theory. Time and space measures, hierarchy theorems, complexity classes P, NP, PSPACE, etc., P vs. NP, Cook’s theorem, NP-complete problems, etc.

III. Special Topics in Algorithmic Theory. Dynamic programming, greedy algorithms, matrix operations, number-theoretic algorithms, string matching, computational geometry, approximation algorithms, etc. (as time allows).
Evaluation:

Grading will be based on homeworks and three exams, as follows:

- **Homeworks (14):** 10%
- **Exam I** (in class, Thurs., Feb. 12): 30%
- **Exam II** (in class, Thurs., Mar. 25): 30%
- **Exam III** (8:00–10:00 AM Thurs., May 6): 30%

Final grades will be determined by overall average as follows:

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<thead>
<tr>
<th>Grade</th>
<th>Range</th>
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<tbody>
<tr>
<td>A</td>
<td>90 – 100</td>
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<tr>
<td>A-</td>
<td>85 – 89.9</td>
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<tr>
<td>B</td>
<td>80 – 84.9</td>
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<td>B-</td>
<td>75 – 79.9</td>
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<td>C</td>
<td>70 – 74.9</td>
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<tr>
<td>C-</td>
<td>65 – 69.9</td>
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<td>D</td>
<td>60 – 64.9</td>
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<td>F</td>
<td>0 – 59.9</td>
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Class Policies:

- **Class attendance:** Class attendance will be taken. Decisions on borderline grades will be based upon exceptional class attendance and participation, as deemed merited by the course instructor. If you miss class, you must obtain the covered material from a willing classmate. Neither the instructor nor the TAs will be available (during office hours or other times) to repeat material covered in class.

- **Announcement responsibilities:** Important announcements, schedule revisions, etc., may be made in class or posted to the class email list. You are responsible for all announcements.

- **Homework assignments and due dates:** Homework assignments will be handed out in class and posted on the course web site. Homeworks are due at the beginning of class (in the first 2 minutes – 9:42 AM) on the due date, except if otherwise noted. No credit will be given for homeworks turned in late.

- **Collaboration policy:** Homeworks are mostly individual efforts. You may have discussions with others, share ideas and thoughts, and assist each other in understanding the material, but your homework submission must be the product of an individual. This form of collaboration shouldn’t be an opportunity to copy answers from others. You are not permitted to seek solutions on the internet.

- **Cheating:** Cheating will be dealt with harshly, and may result in failure of the assignment/exam and/or failure of the class. Each student is expected to do his or her own work. Each student is responsible for securing his or her homework and exams from direct copying. Each student is expected to abide by UT’s policies on academic conduct as outlined in the University of Tennessee Graduate School Catalog (2003-2004), page 19, and the HillTopics Student Handbook (2003-2004), pages 10-12.

- **Exams:** The exams will be in class, closed book, closed notes. Each exam will be comprehensive of all the material covered in class, although later exams will emphasize material covered since the last exam.

- **Missed exam:** If you have an excusable absence from an exam, your final exam grade may be counted as your missed exam grade (i.e., it will count twice). The instructor reserves the right to administer a make-up exam, at her discretion. Barring exceptional circumstances, you must contact the instructor to explain your absence within 24 hours of a missed exam. Otherwise, the absence will be considered unexcused, and your grade for that exam will be 0. Talk to the instructor now if you have any foreseeable conflicts with the given exam dates.

- **Grading corrections:** Bring any exam grading correction requests to the instructor within 1 week of receiving the grade, or before the end of the semester, whichever comes first. Bring any homework grading correction requests to the TA within 1 week of receiving the grade, or before the end of the semester, whichever comes first. After that, your grade will not be adjusted. If you find any mistake in grading, please let the instructor or TA know. Your grade will not be lowered.

- **Drop policy:** Late drops are discouraged and are unlikely to be approved.

- **Inclement weather:** We will follow the standard University of Tennessee policy on inclement weather, which is posted at [http://www.utk.edu/weather/](http://www.utk.edu/weather/).