Email will get a faster response (usually within 24 hours) for questions, appts, etc. Only use the phone for emergencies when you have no access to email (e.g. “I am in Australia and will miss today’s exam.”)

Course Description:
Design and construction of compilers including lexical analysis; parsing techniques such as LL(1), LR, and LALR(1) code generation techniques. Error analysis and simple code optimizations will be introduced. A large-scale project consisting of developing a lexical analyzer, parser, abstract syntax tree, symbol table, activation code, and intermediate code generation, and finally generating assembly code will be implemented. Students will design and implement a compiler using standard UNIX-based compiler tools for a small but representative language.

CSC416 Prerequisites: CSC 220, 241, 242  
CSC565 Prerequisites: CSC 520  
Credits: 3

Student Learning Outcomes:
- An ability to apply knowledge of computing and mathematics appropriate to the discipline.  
- An ability to use current techniques, skills, and tools necessary for computing practices.  
- An ability to apply mathematical foundations, algorithmic principles, and Computer Science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.  
- An ability to apply design and development principles in the construction of software systems of varying complexity.  
- An ability to use current techniques and skills necessary for computing practices.  
- An ability to design and develop software systems of varying complexity.

Course Website: www.cs.wcupa.edu/rburns/Compilers  
Supplemental Course Website: d2l.wcupa.edu

Required Text:

Required Hardware:
We will utilize the West Chester University CS laboratories throughout the semester. Credentials will be provided to you.
Software / Programming Languages:
We will utilize the Java programming language and various tools throughout the semester. All software will either be free to download or provided to you.

Evaluation Policy:
- 30% - Course Project / Programming. (There will be a major programming project in the course with intermediate deadlines spaced throughout the semester.)
- 20% - Written Homeworks. (Conceptual problems will also compose a portion of the overall evaluation.)
- 20% - Midterm Exam
- 30% - Final Exam

CSC 416 Grade Scale:

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<th>89-87</th>
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<th>79-77</th>
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<th>62-60</th>
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CSC 565 Grade Scale:

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<td>B-</td>
<td>C+</td>
<td>C</td>
<td>C-</td>
<td>F</td>
</tr>
</tbody>
</table>

Lateness Policy:
Assignments that are late are assessed a **10% per day late penalty**. Saturday and Sunday are each days.

Course Outline:
The course schedule is posted on D2L. The schedule is tentative and is subject to change.

This list outlines the topics that we will study in the course and may be modified as the semester progresses.

1. Course Introduction; Compiler Overview
2. Data Structures for Tree Languages
3. Lexical Tokens
4. Regular Languages
5. Finite Automata
6. Converting Regexs into DFAs
7. Parse Trees and Derivations
8. Top-Down Parsing
9. Eliminating Left Recursion
10. Left Factoring
11. LL(1) Parsing Tables
12. Bottom-Up Parsing
13. Parsing Tools and Error Recovery
14. Abstract Syntax Trees
15. Visitor Design Pattern
16. Semantic Actions
17. Disambiguating Grammars
18. Symbol Tables
19. Type Checking
20. Frame Layouts
21. Runtime Organization
22. MIPS
23. Code Generation
24. Local Optimization
25. Global Optimization
26. Register Allocation

Warning to Students!
This is a challenging class. If you do not have the time or energy to dedicate to performing the work for this class, you should not enroll. The requirements for this class will not be reduced no matter how much other work you encounter in other classes that you may be enrolled in.

Phone Policy:
If you let your phone ring during class, you will see your final grade diminish at my discretion. Turn your phone on silent before class begins, not on low or vibrate. It is distracting to your classmates. If you choose to text during class, you will see your grade diminish at my discretion. If you choose to answer your phone during class, you will lose 5% off of your final average. If you have an emergency situation, please discuss it with me in advance. Phones are not permitted to be out during exams. If your phone is taken out during an exam, you will receive a 0 for the exam.

Attendance Policy:
You are allocated two unexcused absences. Each class that you miss thereafter due to an unexcused absence is one point off your final grade. Being late twice is the same as one absence. Sleeping in class is the same as being absent. If you miss a class, you are responsible for getting the notes from one of your classmates.

Absences due to serious illness or family emergencies will be considered excused, and will not impact your attendance grade. Be sure to email me and provide documentation. Being in jail, having to go to court to avoid jail, family vacations, etc. are not excusable absences. I reserve the right to determine what is “excused” versus “unexcused”.

University Sanctioned Events Policy:
Students participating in participating in University sanctioned events such as, but not limited to, the Marching Band, musical ensembles, theatre group, athletic events, forensics competition, etc., will be granted an excused absence for class periods missed. Students will be granted the privilege of taking, at an alternative time to be determined by the professor, scheduled examinations or quizzes that will be missed. I will designate such times prior to the event and reserve the right to provide a fair alternative to taking the examination or quiz that will be missed. Students must submit original documentation on University letterhead signed by the activity director, coach, or adviser detailing the specifics of the event in advance. Specific requirements include:

1. Responsibility for meeting academic requirements rests with the student.
2. Students are expected to notify their professors as soon as they know they will be missing class due to a University sanctioned event.
3. Students are expected to complete the work requirement for each class and turn in assignments due on days of the event prior to their due dates unless other arrangements are made with myself.
4. If a scheduled event is postponed or canceled, the student is expected to go to class.
5. Students are not excused from classes for practice on nonevent days.

The following are specifics for the student athlete:
1. The student athlete is expected, where possible, to schedule classes on days and at hours that do not conflict with athletic schedules.

2. Athletes are not excused from classes for practice or training-room treatment on nongame days.

**Email Policy:**

It is expected that faculty, staff, and students activate and maintain regular access to University provided e-mail accounts. Official university communications, including those from your instructor, will be sent through your university e-mail account. You are responsible for accessing that mail to be sure to obtain official University communications. Failure to access will not exempt individuals from the responsibilities associated with this course.

Please abide by the following email etiquette policies to ensure clear communication:

*Subject Line:* Please include a descriptive and specific subject heading for all of your emails, including course and section number (e.g. “CSC 050-23: Question about lab 1”).

*Greeting:* Please make a clear and appropriate greeting; I will not answer emails addressed to “hey” or “yo”. Please address me as Dr. Burns or simply Dr. B, or “Professor”.

*Tone & Style:* Always use a tone and language that is appropriate to an academic setting; I will not respond to emails that are written in short-hand or without proper punctuation and grammar. Your emails should not resemble a text message.

*Sign and Proofread:* Always sign your full name, especially if you are writing from your smart phone. Always proofread your emails before sending.

*Email Account:* I do not care which email account you send email from, as long as it is clearly addressed and signed so that I know who you are. But please be advised to appropriately link the email that you wish to use with myWCU and D2L; I will be using those services to send out emails to the entire class. It is your responsibility to make sure this is configured correctly so that you receive my emails.

**Computer Science Department Dishonesty Policy:**

The Computer Science Committee has adopted the following policies in regard to academic dishonesty in Computer Science classes:

1. A student found to be academically dishonest in an assignment will receive zero for that assignment if it is his/her first offense in that class [the course, not the class period], but an F for the course if it is for his/her second offense in that class [the course].

2. A student found to be academically dishonest in a test will receive the grade of F in that class [the course].

3. For the purposes of this document on academic dishonesty, every form or method of evaluation in a class will be considered as being of one of two types: an assignment or a test. Assignments include homework assignments, and short quizzes [and labs]. Tests include final exams and major exams. An instructor has, subject to these guidelines, the discretion to determine the type of any other form of evaluation, such as a project, in his/her class.

4. A student who has received the grade of F in a course because of academic dishonesty and who wants or is required to repeat that course may re-take that course only as a regularly scheduled course that is open to the student community in general. In exceptional circumstances, this condition may be revoked, but only by an explicit action to that effect by the full Computer Science Committee, and only then on a case by case basis.

5. The term academic dishonesty is used throughout in the sense provided by the rules and regulations of West Chester University. The following is taken from The Ram's Eye View of 1997-1998: “Academic dishonesty as it applies to students includes but is not limited to academic cheating; plagiarism; the sale, purchase, or exchange of term papers or research papers; falsification of information which includes any form of providing false or misleading information, written, electronic, or oral; or of altering or falsifying official institutional records.
Plagiarism is defined as copying another's work or portion thereof and/or using ideas and concepts of another and presenting them as one's own without giving proper credit to the source.”

**Policies concerning granting of No-Grade, violation of academic integrity, and violation of student code of conduct:**
For questions regarding Academic Dishonesty, the No-Grade policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to their major department’s handbook, the Undergraduate Course Catalogue, the Rams Eye View, or the University Web Site. Please understand that improper conduct in any of these areas will not be tolerated and may result in immediate ejections from the class.

**ADA Policy:**
If you have a disability that requires accommodations under the Americans with Disabilities Act (ADA), please present your letter of accommodations and meet with me as soon as possible so that I can support your success in an informed manner. Accommodations cannot be granted retroactively. If you would like to know more about West Chester University’s Services for Students with Disabilities (OSSD), please contact the OSSD which is located at 223 Lawrence Center. The OSSD hours of Operation are Monday – Friday 8:30 a.m. – 4:30 p.m. Their phone number is 610-436-2564, their fax number is 610-436-2600, their email address is ossd@wcupa.edu, and their website is at www.wcupa.edu/ussss/ossd.

**Title IX Statement:**
West Chester University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University’s Title IX Coordinator, Ms. Lynn Klingensmith. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University protection of minors policy. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at the webpage for the Office of Social Equity at http://www.wcupa.edu/_admin/social.equity/.

**Emergency Contact:**
In the event of an emergency during class, the phone number for WCU’s Department of Public Safety is 610-436-3311.

**APSCUF:**
I am a member of APSCUF, the Association of Pennsylvania State College and University Faculties. We uphold the highest standards of teaching, scholarly inquiry, and service. We are an organization that is committed to promoting excellence in all that we do to ensure that our students receive the highest quality education. For more on our organization, see www.apscuf.org.