University of Windsor

School of Computer Science – Winter 2018
60-214-01 Languages, Grammars, and Translators
Course Outline

Instructor:	Zamilur Rahman **Email:** rahma11u@uwindsor.ca[1] **Office Hours:** TR, 4:00pm-5:00pm in LT-3107 (PC Lab), or by appointment.
Lectures:	TR, 2:30pm-3:50pm in Erie Hall ER-1118
Course Description:	As it appears in the University of Windsor Calendar. *Pragmatic and theoretical aspects of grammars, recognizers, and translators for computer languages will be discussed. The topics covered will include regular languages and context-free languages, including parsers and parser generators for such languages. Attribute grammars, syntax-directed translation, interpreters and compilers will also be discussed.*
Prerequisite:	60-100 and 60-212.
Textbook(s):	Alfred V. Aho, Monica S. Lam, Ravi Sethi, and Jeffrey D. Ullman. Compilers: Principles, Techniques, and Tools, 2/E. Pearson, 2006
Other resources:	1. Java Tutorials 2. Java Regular Expressions 3. JFlex 4. JFLAP 5. Java CUP 6. Lex & Yacc 7. LANCECompiler
Course Website:	https://blackboard.uwindsor.ca/
Course Evaluation:	15% Midterm 1 20% Midterm 2 25% Assignment 40% Final Exam
Grading Scheme:	The University of Windsor uses a percentage marking and grading scale. Grades are assigned as integer-valued grades. More details can be found in the senate policy "Grading and Calculation of Averages" at the University of Windsor Senate web page: http://www.uwindsor.ca/secretariat/.

[1]Only emails originating from a valid University of Windsor student account will be considered from students wishing to contact the instructor through email. Please include your full name and student ID in your correspondence

Tentative Lectures schedule[2]

Week	Topic
1: Jan 4	Course outline. Introduction to Compilers
2: Jan 8-14	Lexical analysis: regular expressions, regular definitions, and extensions of regular expressions
3: Jan 15-21	Finite Automata (FA), from regular expressions to automata, design of a lexical-analyzer generator. Lexical generator JLex/JFlex.
4: Jan 22-28	Context-free grammars (CFG), Chomsky normal form, derivations: leftmost and rightmost derivations, Parse trees: constructing parse trees.
5: Jan 29-Feb 4	Ambiguous grammar, eliminating ambiguity, context-free grammars versus regular expressions **Feb 1, 2018 - Midterm 1 (during class period)**.
6: Feb 5-11	Top down parsing: recursive descent parsing, FIRST and FOLLOW.
7: Feb 12-18	Top-down parsing: left recursion and its removal, left factoring of a grammar, predictive parsing, LL(1) parsing.
8: Feb 19-25	*Reading week, no classes*
9: Feb 26-Mar 4	Bottom-up parsing: shift-reduce parsing, LR(0) parsing, SLR parsing.
10: Mar 5-11	Bottom-up parsing, LR(1) parsing, LALR parsing. **Mar 8, 2018 - Midterm 2 (during class period)**.
11: Mar 12-18	Parser generator: Use JavaCup/Yacc to generate parser from a context free grammar.
12: Mar 19-25	Syntax-directed definitions (SDD), attribute grammar, applications of syntax-directed translation.
13: Mar 26-Apr 1	Variants of syntax trees, three-address code. **Mar 29: Study day, no classes.**
14: Apr 2-8	Types and declarations, translation of expressions, type checking. **Apr 6: Last day of winter classes.**
	Apr 14, 2018: Final Exam at 3:30pm **Loaction: TBA.**

Notes to Students:

- **Homework submission and late submission policy:** Homework assignments are expected to be submitted on the assigned due date and time. Late submissions of assignments are either not accepted or heavily penalized depending upon the length of delays in submissions. You must allocate enough time to complete the assignments; start early and report any difficulties to the instructor. You must follow the submission procedure (e.g., either on Blackboard or hardcopy etc.) mentioned on each assignment before submitting your work. Failure to submit the work in the correct format may also be penalized. (e.g. incorrect, unreadable and/or missing file attachments as instructed). Each assignment must be done individually, with no copying from any other source (see policy on Academic Misconduct).

- **Missed Midterm(s)/Final exam policy:** Midterm tests which are missed for any reason whatsoever cannot be made up. In such cases, where a student has missed a test for medical reasons, the mark for this test will be carried over to the final. A doctor's note will have to be a copy of the official Student Medical Certificate and must specifically say that you were not fit to write the test on the particular day. If you miss the final exam and have valid and verifiable reason, you will be required to write a makeup exam (see the Makeup exam policy below).

- **Missed makeup Final exam policy:** The final exam must be written in order to obtain a grade for the course. If you are not able to write the final exam for medical reasons (same as above), you

[2]Students are advised that the topics described above are tentative and that the material and/or depth and order of presentation are subject to change at the discretion of the instructor and student pace.

must contact me immediately to let me know so that a make-up final exam can be arranged as soon as possible. There will be no makeup of the makeup final exam and the final grade will be assigned on the basis of completed work.

- **Policy on academic misconduct (cheating/plagiarism, etc.):** You are expected to do all of your work in any of the homework assignments and exams individually, without the help of others. In a plagiarized student's work, you will get zero points for that homework assignments or question in exam and the student(s) will have to answer to the Director of School of Computer Science and/or Dean of Science. This will be irrespective of who cheated from whom. You are responsible to protect your work from others. The University expects that both the data and ideas obtained from any and all published or unpublished material will be properly acknowledged and sources disclosed. Failure to follow this practice constitutes plagiarism and is a form of academic misconduct subject to disciplinary procedures as set out under Senate Bylaw 31.

- **Plagiarism:** SafeAssign will be used for all some or all student assignments in this course, at the instructor's discretion. You will be advised how to submit your assignments. Students who submit semantically equivalent assignments (in other words, the same material with trivial or negligible modifications) will receive a grade of zero on ALL assignments.

- **Student Evaluation of Teaching (SET):** The Student Evaluation of Teaching (SET) will be conducted during the last 2 weeks of the classes

- **Important Dates:**

  Jan 17, 2018 - Last day for late registration and change of courses, and full tuition refund.
  Feb 1, 2018 - Midterm 1 (during class period).
  Feb 19-25, 2018 - Reading week (no classes).
  Mar 8, 2018 - Midterm 2 (during class period).
  Mar 14, 2018 - Last day to voluntarily withdraw from winter term courses and partial tuition refund.
  Apr 14, 2018 - Final Exam at 3:30pm. **Location:** TBA.