



General Information

Date:	3/18/21	*Effective Term:	Fall 2021
College/Department:	Engineering/Computer Science		
Course Designator and Number (Cross-listed Course Designator and Number):	CS 5304		
Title of Course:	Translator Design and Construction		
Instructor and/or Department Contact:	Trey Mayo/Director of Graduate Programs		
Contact Phone:		Contact E-mail:	treymayo@vt.edu

Prerequisite Enforced

Enable prerequisite enforcement? Yes No

Add the following Prerequisite/Corequisites:

Graduate standing in the CSA program

Attach department letter of support to include a non-departmental course as a prerequisite/corequisite.

Drop the Following Prerequisites/Corequisites:

(CS 4114 (UG) OR CS 5034 (UG)) OR (CS 4114 OR CS 5034)

List Course Prerequisites/Corequisites after change:

Graduate standing in the CSA program

Justification (Justify prerequisite/corequisite changes and remaining prerequisites/corequisites after change)

CS 5034 has been deactivated and is no longer offered. UG CS course has also been removed as student needs to be admitted to CSA graduate program in order to take the course.

If adding a minimum grade as a prerequisite for a course, data must be provided to clearly show the need for that minimum grade in order to be successful in the course. Minimum grade requirements may not be used as a way to limit enrollment.

- *If request is being processed for the upcoming **effective term**:
- Requests to **ADD** prerequisite requirements (i.e., turn enforcement **ON**, add grade restriction, add course) must be processed prior to the opening of "course request" for the applicable effective term.
 - Requests to **REMOVE** prerequisite requirements (i.e., turn enforcement **OFF**, remove a grade restriction, drop course) may be completed at any time, unless the removal causes the course to be more restrictive.

Approval Signatures

Department Head/Chair		Date	3/18/2021
College Curriculum Committee Representative		Date	3/19/21
College Dean		Date	3/19/21

COMPUTER SCIENCE 5304
TRANSLATOR DESIGN AND CONSTRUCTION
(ADP TITLE: TRANS DESIGN AND CON)

I. CATALOG DESCRIPTION:

5304 TRANSLATOR DESIGN AND CONSTRUCTION

Fundamental theory of parsing and translation and practical applications of this theory. Lexical analysis, parsing techniques based on top-down (LL, Recursive Descent) and bottom-up (LR, Precedence), code generation, code optimization techniques and runtime systems.

Pre: 4114 or 5034; (3H,3C). II.

II. LEARNING OBJECTIVES:

Having successfully completed this course, the student will be able to design and implement translators for conventional languages. The student will also be able to compare the advantages and disadvantages of formal and informal methods of translator construction and to identify and discuss the inherent linkages between formal language and translator construction techniques.

III. JUSTIFICATION:

Since the introduction of the first computer, translators have played the most prominent role in providing the mechanism through which humans instruct computers. The diversity and complexity of today's languages mandate graduate-level courses that address their proper translation and interpretation. The translator design and implementation course will provide the environment in which students can study the crucial design strategies and implementation techniques for this indispensable tool.

One of the new core courses, 5034, has been added as an alternative prerequisite. Since all graduate students must take 5034, having it as a prerequisite to this course ensures all graduate students access to it without having to take the undergraduate formal languages course, 4114.

IV. PREREQUISITES AND COREQUISITES:

For this course a student needs the background in formal languages taught in 4114 or 5034 so the student will have a working knowledge of such topics as grammars, finite state machines, and push down automata.

V. TEXTS AND SPECIAL TEACHING AIDS:

Required text:

Aho, Alfred V., Ravi Sethi, and Jeffrey D. Ullman. **COMPILERS: PRINCIPLES, TECHNIQUES, AND TOOLS.** Reading, Massachusetts: Addison-Wesley Publishing Company, 1986. x, 796.

10. Code Optimization Techniques	10%
11. Storage Mapping, Arrays, Aggregates, and Equivalences	10%
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	100%

VIII. CORE CURRICULUM GUIDELINES:

NA