THE CHINESE UNIVERSITY OF HONG KONG
Print Course Catalog Details

Academic Org: Dept of Computer Sci & Engg – Subject: Computer Science

Course: CSCI3120 **Course ID:** 002584 **Eff Date:** 2024-07-01 **Crse Status: Active** **Apprv. Status:** Approved **[**Course Rev**]**
Compiler Construction 編譯程序構造

The course aims at teaching students about compiler development methodology and its associated technology to modern applications. The course contents included formal aspects, lexical analysis, syntax analysis, syntax-directed translation, run-time environments, intermediate code generation, code generation and code optimization.

本科旨在教授學生有關編譯程序開發方法及其於現代應用之相關技術。本科內容包括形式方面、詞法分析、語法分析、語法導向之翻譯、運行時環境、中間代碼之生成、代碼生成及編碼優化。

Grade Descriptor:

A

EXCELLENT – exceptionally good performance and far exceeding expectation in all or most of the course learning outcomes; demonstration of superior understanding of the subject matter, the ability to analyze problems and apply extensive knowledge, and skillful use of concepts and materials to derive proper solutions.

有關等級說明的資料，請參閱英文版本。

B

GOOD – good performance in all course learning outcomes and exceeding expectation in some of them; demonstration of good understanding of the subject matter and the ability to use proper concepts and materials to solve most of the problems encountered.

有關等級說明的資料，請參閱英文版本。

C

FAIR – adequate performance and meeting expectation in all course learning outcomes; demonstration of adequate understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

D

MARGINAL – performance barely meets the expectation in the essential course learning outcomes; demonstration of partial understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

F

FAILURE – performance does not meet the expectation in the essential course learning outcomes; demonstration of serious deficiencies and the need to retake the course.

有關等級說明的資料，請參閱英文版本。

Equivalent Offering:
Units: 3 (Min) / 3 (Max) / 3 (Acad Progress)
Grading Basis: Graded
Repeat for Credit: N
Multiple Enroll: N
Course Attributes:

Topics:

COURSE OUTCOMES

Learning Outcomes:

At the end of the course of studies, students will have acquired:
1. Fundamental concepts of the compiler, in particular, lexical analysis, syntax analysis, and code generation and optimization;
2. Deep understanding of how programming languages are executed in machines/computers;
3. Implementation experience in developing a real compiler for a certain programming language.

Course Syllabus:

Week 1: Course Overview and Project Introduction
Week 2: Formal Aspects in Compiler
Week 3: Lexical Analysis

Week 4: Syntax Analysis
Week 5: Syntax-Directed Translation
Week 6: Top-Down Parsing
Week 7: Bottom-Up Parsing
Week 8: Semantic Analysis
Week 9: Run-time Environments
Week 10: Intermediate Code Generation
Week 11: Code Generation
Week 12: Code Optimization
Week 13: Course Summary and Project Presentation

Assessment Type:

Examination	: 40%
Homework or assignment	: 20%
Project	: 40%

Feedback for Evaluation:

1. Results of assignments and examination;
2. Course evaluation and questionnaire;
3. Reflection of teachers;
4. Question-and-answer sessions during class;
5. Student consultation during office hours or online;

Required Readings:

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Recommended Readings:

1. [ASU86] Aho, A.V., Sethi, R., and Ullman, J.D., Compilers: Principles, Techniques, and Tools, Addison-Wesley, 1986. (Reserved in UL)
2. [ALS+07] Aho, A.V., Lam, M.S., Sethi, R., and Ullman, J.D., Compilers: Principles, Techniques, & Tools, Second Edition, Addison-Wesley, 2007. (available in the University Library)
3. [AeK01] Allen, R. and Kennedy, K., Optimizing Compilers for Modern Architectures, Morgan Kaufmann, 2001.
4. [CoT04] Cooper, K.D. and Torczon, L., Engineering a Compiler, Morgan Kaufmann, 2004.

5. [Ric09] Rich, E., Automata, Computability, and Complexity, Prentice Hall, 2009.
6. [Seb08] Sebesta, R.W., Concepts of Programming Languages, 8/e, Addison Wesley, 2008.

OFFERINGS

1. CSCI3120 Acad Organization=CSD; Acad Career=UG

COMPONENTS

LEC : Size=30; Final Exam=Y; Contact=3
TUT : Size=30; Final Exam=N; Contact=1

ENROLMENT REQUIREMENTS

1. CSCI3120

Enrollment Requirement Group:
Prerequisite: CSCI3130

New Enrollment Requirement(s):
Pre-requisite = CSCI3130

Additional Information

eLearning hrs for blended cls 0
VTL-Onsite face-to-face hrs 0
VTL-Online synch. hrs 0
VTL-Online asynch. hrs 0
No. of micro-modules 0
Research components (UG) 0%

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