

Course specification

(4203 Compiler Theory)

Faculty: HICIT- Higher Institute for Computers & Information Technology

Programme(s) on which the course is given: Under graduate program in Computer Science

Major or minor element of programme: Elective

Department offering the programme: Department of Computer Science

Department offering the course: Department of Computer Science

Year / Class: 4th Year – 2nd Semester

Date of specification approval: 22/2/2016

A- Basic Information

Title: Compiler Theory

Code: 4203

Weekly Hours:

Lecture : 3

Exercise: -

Practical: 3

Total: 6

B- Professional Information

1- Course Objectives:

The student will learn principles of compiler construction and operation. Topics will include: lexical analysis, symbol tables, parsing, type checking, optimization, and code generation.

2- Program ILOs Covered by Course

Program Intended Learning Outcomes			
Knowledge and understanding	Intellectual Skills	Professional and practical skills	General and Transferable skills
a10	b1, b2, b4, b15	c10	d12

3 - Intended learning outcomes of course (ILOs)

Successful completion of this course will lead to the following learning outcomes:

a- Knowledge and Understanding

Students should:

- a1. Understand the basic phases of Compilation.
- a2. Understand how compilers operate.

b- Intellectual skills

The ability to:

- b1. Analyze and recognize the significance of the several phases through which a typical program is compiled.

c- Professional and practical skills

The ability to:

- c1. Implement typical compilation phases.
- c2. Design a simple compiler.

d- General and transferable skills

The ability to:

- d1. Work in a group in order to design and implement a typical high level language compiler.
- d2. Present the implemented compiler and make a demo.

4- Contents

Topic	Hours	Lec.	Exc/Lab
Introduction to compiler theory	6	3	3
Scanning & Finite Automata	18	9	9
Context- Free Grammars & Parsing	18	9	9
Semantic Analysis	6	3	3
Runtime Environment	6	3	3
Code Generation	12	6	6
Implementation project in compiler design	12	6	6

5 -Teaching and learning methods

- 5.1 Lectures
- 5.2 Tutorial Exercises
- 5.3 Practical Lab
- 5.4 Discussions.

6-Student assessment methods

- 6.1 Midterm Exam: To assess the knowledge and understanding achieved by the student during the previous weeks.
- 6.2 Final Exam: To evaluate what the student gain at the end of the course, and to assess: the knowledge and understanding, general skills, and intellectual skills.
- 6.3 Course Project: To allow students work in team, and to evaluate knowledge, understanding, intellectual, and transferable skills.
- 6.4 Course Work &Quizzes: To keep the student always in the course, and to evaluate knowledge, understanding, intellectual, and transferable skills.

Assessment Schedule

Assessment	Week #
Mid Term Exam	8
Final Exam	16
Course Project	3-14
Course Work &Quizzes	2-14

Assessment Weight

Assessment	Weigh %
Mid Term Exam	5%
Final Exam	80%
Course Project	10%
Course Work &Quizzes	5%
Total	100

Course Work &Quizzes: (Short Exams, Assignments, Researches, Reports, Presentations, Class/Project discussion)

7- List of references

7.1 Text Books

- Compiler Construction: Principles and Practice, Kenneth C. Louden

7.2 Internet Location :

- www.cs.sjsu.edu/~louden/cmptext/
- There are some quite useful online books, notes, and information sources. Searching on Google will lead you to many sources. Among are the following:

http://lambda.uta.edu/cse5317/notes.pdf	Design and Construction of Compilers, Leonidas Fegaras, 2004.
http://scifac.ru.ac.za/compilers	Compilers and Compiler Generators: an introduction with C++, P. D. Terry, Rhodes University, 1997.
http://www.compilers.net/Dir/Free/Books	A set of links to free compiler related books on the net.
http://www.thefreecountry.com	Free programmers' resources including links to many free compilers, some of whom's source code is readily available to inspect.
http://www.sai.msu.su/sal/F/1	Scientific applications on Linux, which includes an extensive list of links to compilers.
http://www.compilerconnection.com	Links to compiler information.

8- Required Facilities

7.1 Tools/Software

- .NET framework

9-Course Matrices

9.1-Course Content/ILO Matrix

Course Contents	a1	a2	b1	c1	c2	d1	d2
Introduction to compiler theory	√						
Scanning & Finite Automata		√	√	√	√		
Context- Free Grammars & Parsing		√	√	√	√		
Semantic Analysis		√	√	√	√		
Runtime Environment			√				
Code Generation		√	√	√	√		
Course Project						√	√

9.2-Learning Method /ILOs Matrix

Learning Methods	a1	a2	b1	c1	c2	d1	d2
Lectures	√	√	√	√	√		
Tutorial Exercises			√	√	√		
Practical Lab			√	√	√		
Discussions.			√	√	√	√	√

9.3- Assessment Methods /ILOs Matrix

Assessment Methods	a1	a2	b1	c1	c2	d1	d2
Mid Term Exam	√	√	√	√	√		
Final Exam	√	√	√	√	√		
Course Project	√	√	√	√	√	√	√
Course Work & Quizzes	√	√	√	√	√	√	√

Course Coordinator: Prof.Dr. Ahmed El-Abbassy ()

Head of Department: Dr. Farouk Shabaan ()

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