



Shoubra Faculty of Engineering

Course Specifications: Compilers

A- Basic Information

Course Title : Compilers Course Code : ECE421C
Teaching Hours: Lecture : 4 Tutorial : 2 Practical : Total: 6
Program on which the course is given: B.Sc. Electrical Engineering (computer engineering)
Major or minor element of program: N. A.
Department offering the program: Electrical Engineering Department
Department offering the course: Electrical Engineering Department
Academic year / level: Fourth Year/ Second Semester
Date of specifications approval: 20/6/2010

B- Professional Information

2- Course Aim

For students undertaking this course, the aims are to:

- 1- develop a thorough understanding of the basic structure and operation of compilers.
- 2- implement a compiler for a simplified language.
- 3- Develop knowledge of software techniques related to compilers and system utility routines

3- Intended Learning Outcomes of Course (ILOS)

a- Knowledge and Understanding

On completing this course, students will be able to:

- a- 1 - Define characteristics of engineering materials in the compilers and interpreters area.
- a- 2 - Identify engineering principles in the field of Syntax Analysis.

b- Intellectual Skills

At the end of this course, the students will be able to:

- b- 1- Think in a creative and innovative way in problem solving and design of Intermediate code generator.
- b- 2 - Create systematic and methodic approaches in dealing with new and advancing technology
- b- 3- Identifying symptoms in problematic situations in the field of Lexical Analysis.

c- Professional Skills

On completing this course, the students are expected to be able to:

- c-1 - Apply knowledge of mathematics, science, information technology, design, business context and engineering practice to code optimization problems.
- c- 2 - Create and/or re-design a process, component or system, and carry out specialized engineering designs.
- c- 3 - Write computer programs on professional levels achieving acceptable quality measures in software development in the field of Code generation and optimization.

d- General Skills

At the end of this course, the students will be able to:

- d- 1 - Demonstrate efficient IT capabilities.
- d- 2 - Refer to relevant literatures

4- Course Contents

No.	Topics	No. of hours
1	Overview: compilers and interpreters	6
2	Lexical Analysis	12
3	Syntax Analysis: Grammar	6
4	Syntax Analysis: Parsing	6
5	syntax-directed translation	12
6	Intermediate code generation	12
7	Run time environment	6
8	Code generation and optimization	12
9	Machine independent optimization	6

5- Teaching and Learning Methods

- 5.1- Updated Lectures
- 5.2- Practical training / laboratory
- 5.3- Class activity
- 5.4- Assignments / homework
- 5.5 Project Implementation

6- Teaching and Learning Methods of Disables

None

7- Student Assessment

a- Student Assessment Methods

1	Assignments to assess knowledge and intellectual skills.
2	Quiz to assess knowledge, intellectual and professional skills.
3	Mid-term exam to assess knowledge, intellectual, professional and general skills
4	Final project to assess knowledge and intellectual skills.
5	Final exam to assess intellectual, professional and general skills.

b- Assessment Schedule

No.	Assessment	Week
1	Assignments	2, 5, 9, 11
2	Quizzes	4, 6, 10, 12
3	Mid-term exam	8
4	Oral Exam	14
5	Final exam	15

c- Weighting of Assessments

Assessment	Weight
Mid_Term Examination	13 %
Final_Term Examination	60 %
Oral Examination	13.4 %
Quizzes / reports	7 %
Home assignments	6.6 %
Total	100 %

8- List of References

a- Course Notes

1- Course notes prepared by instructor.

b- Books

1- Aho, Lam, Sethi, Ullman, "Compilers Principles, Techniques and Tools", 2nd edition 2006

c- Web Sites

- 1- <http://en.wikipedia.org/wiki/Compiler>
- 2- <http://www.cs.princeton.edu/~appel/modern/java/JLex/>

- **Course Coordinator :** Dr/ May Ahmed Salama Mohamed
- **Head of Department :** Prof/ Sayed Abo-Elsood Sayed Ward



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Course Specifications: Compilers (2014 - 2015)

Matrix of Knowledge and Skills of the course

No.	Topics	week	Basic Knowledge	Intellectual Skills	Professional Skills	General Skills
1	Overview: compilers and interpreters	1	A1		C2	
2	Lexical Analysis	2	A2	B3		D1
3	Lexical Analysis	3	A2	B3		D1
4	Syntax Analysis: Grammar	4		B2	C1, C3	
5	Syntax Analysis: Parsing	5	A1		C2, C3	
6	syntax-directed translation	6	A1, A2	B2		D1, D2
7	syntax-directed translation	7	A1, A2	B2		D1, D2
8	Midterm Exam	8				
9	Intermediate code generation	9		B1	C1, C2	D2
10	Intermediate code generation	10		B1	C1, C2	D2
11	Run time environment	11	A2	b2		D1, D2
12	Code generation and optimization	12	A1	B1, B2	C3	
13	Code generation and optimization	13	A1	B1, B2	C3	
14	Machine independent optimization	14	A2	B3	C2, C3	D1
15	final exam	15				

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Matrix of course content and ILO's

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Course content	A1	A2	B1	B2	B3	C1	C2	C3	D1	D2
Overview: compilers and interpreters	✓						✓			
Lexical Analysis		✓			✓				✓	
Syntax Analysis: Grammar				✓		✓		✓		
Syntax Analysis: Parsing	✓						✓	✓		
syntax-directed translation	✓	✓		✓					✓	✓
Intermediate code generation			✓	✓		✓	✓			✓
Run time environment		✓		✓					✓	✓
Code generation and optimization	✓		✓	✓				✓		
Machine independent optimization		✓			✓		✓	✓	✓	

Matrix of course aims and ILO's

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develop a thorough understanding of the basic structure and operation of compilers.	✓		✓	✓			✓	✓		
implement a compiler for a simplified language.		✓			✓	✓				✓
Develop knowledge of software techniques related to compilers and system utility routines			✓			✓			✓	

- course ILOS VS Program ILOS:

	A1	A13	B3	B12	B16	C1	C3	C15	D4	D9
A1	√									
A2		√								
B1			√							
B2				√						
B3					√					
C1						√				
C2							√			
C3								√		
D1									√	
D2										√

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