The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus

1	Course title	Compiler Design
2	Course number	1901472
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	Theory of computation (CS 1901241)
5	Program title	Computer science
6	Program code	
7	Awarding institution	University of Jordan
8	Faculty	King Abdullah II School for Information Technology (KASIT)
9	Department	Computer Science Department
10	Level of course	4
11	Year of study and semester (s)	2019/2020/ First
12	Final Qualification	
13	Other department (s) involved in teaching the course	-
14	Language of Instruction	English
15	Date of production/revision	Sep,2019
16	Required/ Elective	Required

16. Course Coordinator:

Prof. Riad Jabri	Office Location	KASIT, First Floor – Beside CS Department
	Office Phone #	06-5355000 ext. 22591
	Office Hours	Wednesday 11:00 – 12:00 or by appointment
	e-mail	**jabri@ju.edu.jo**

18. Course Description:

Introduction to Compiling; Lexical analysis: specification and recognition of tokens, finite automata; Syntax analysis: grammars, top-down and bottom-up passing; Syntax-directed translation; Semantic routines; Storage-allocation strategies; Code generation; Error recovery.

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2. 19. Course aims and outcomes:
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A- Aims: This course aims at:
- a- Showing how to apply the theory of language translation introduced in the prerequisite courses to build compilers and interpreters.
- b- Identifying and exploring the main issues of the design of translators.
- c- Providing necessary skills for the construction of a compiler/interpreter.

B- Intended Learning Outcomes (ILOs): Successful completion of this course should lead to the following learning outcomes:

A- Knowledge and Understanding: Students should …

A1) Understand the basic phases of Compilation.

A2) Be able to understand how compilers operate.

B- Intellectual skills: with the ability to …

B1) Analyze and recognize the significance of the several phases through which a typical program is compiled.

B2) Design a simple compiler.

C- Subject specific skills – with ability to …

C1) Design typical compilation phases.

C2) Implement typical compilation phases

D- Transferable skills – with ability to

D1) Discuss and 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.

20. A- Topic Outline and Schedule:

Course Contents, Teaching/Learning & Assessments Methods with ILOs			
Week	**Topic Details**	**Teaching/Learning & Assessments Methods**	**ILOs** Program **SOs**
2	**Introduction to Compiling.** ○ The phases of a compiler. ○ Compiler-construction tools.	**T:** Lecture & Discussion **L:** Reading lecture notes and Chapter 1 **A:** In class questions	A1 &A2 1,2,3
2	**A simple One-Pass Compiler.** ○ Syntax definition and syntax directed translation. ○ Parsing. ○ A translator of simple expressions. ○ Lexical Analysis. Incorporating a symbol table	**T:** Lecture & Presentation **L:** Programming assignment **A:** Quiz-1 on Chap. 1 , 2 &3	A2, A3, B1 &B3. 1,2,4,5
3	**Lexical Analysis.** ○ The role of the lexical analyzer. ○ Input buffering. ○ Specification of tokens and Recognition of tokens. Finite Automata	**T:** Lecture & Presentation **L:** Reading Chapter 5 L: Programming assignment **A:** In class questions, homework and programming assignment	A1, B1, C1 &C2 1,3,4,5

4	**Syntax Analysis.** ○ The role of parser. ○ Context-free grammars. ○ Writing a grammar. ○ Top-down Parsing. ○ Bottom-up parsing and operator-precedence parsing. - Ambiguous grammars	**T:** Lecture & Presentation **L:** Reading Chapter 6 L: Programming assignment **A:** Quiz-2 on Chap. 5 & 4 homework and programming assignment	A1, B1, C1 &C2 1,2,3,4,5
1	**Type checking.** ○ Type systems. ○ Specification of a simple type checker. Equivalence of type expressions and type conversion	**T:** Lecture & Presentation **L:** Reading Chapter 7 **A:** Midterm Exam in Chap. 1-6	A1, B1, C1 &C2 1,2
1	**Intermediate Code generation.** ○ Intermediate Languages. ○ Declarations. Assignment Statements	**T:** Lecture & Presentation **L:** Reading Chapter 7 L: Programming assignment **A:** homework and programming assignment	A1, B1, C1 &C2 1,2,3
2	**Code Generation.** ○ Issues in the design of a code generator. ○ The target machine. ○ Run-time storage management. ○ Basic blocks and flow graphs. .	**T:** Lecture & Presentation **L:** Reading Chapter 22 **A:** Quiz-3 homework and programming assignment	A1, B1, C1 &C2 1,2,3,4
1	**Code Optimization** ○ Introduction. ○ The principal sources of optimization.	**T:** Lecture & Presentation **L:** Reading references of programming languages **A: Presentation** Final Exam in all chapters covered in class	A1, B1, C1,C2 &D 1,2,3,5

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21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

Teaching (T) Methods:

- Class contact is 3 hours per week. The Course will be delivered using different means like lectures, presentations, and discussion.
- Class lecture is 1 hour, lecture notes, exams (midterm and final) and quizzes are designed to achieve the course goals and objectives.

Learning (L) Methods:

- You should read the assigned topics before class, and participate in class and do whatever it takes for you to grasp this material. Also, ask any question related to compilers.
- You are responsible for all material covered in the class.
- Please communicate with me regarding any concerns or issues related to compilers by either in class, course web page, phone or email.
- The web page (elearning.ju.edu.jo) is a primary communication vehicle. Lecture notes, presentations and syllabus are available on the web.

Assessment (A) Methods:

There will be several assessment methods of evaluation the performance of the students such as attending and class participation, quizzes, programming assignments, conducting the midterm and the final exams.

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Assessment Type	Expected Due Date	Weight
Midterm Exam	TBA	30%
Final Exam	TBA	50%
Activities (Quizzes etc.)	TBA	30%

23. Course Policies:

A- Attendance policies:

- Excellent attendance is expected.
- The University of Jordan policy requires the faculty member to assign ZERO grade (F) if a student misses 10% of the classes that are not excused.
- Sign-in sheets will be circulated.
- If you miss class, it is your responsibility to find out about any announcements or assignments you may have missed.

B- Absences from exams and handing in assignments on time:

- Makeup exams according to the University of Jordan regulations.
- Assignments should be Handed on times

C- Health and safety procedures:

- The University of Jordan procedures

D- Honesty policy regarding cheating, plagiarism, misbehavior:

- Cheating or copying on exam or quiz is an illegal and unethical activity.

Standard University of Jordan policy will be applied:

E- Grading policy:

University Intended Grading Scale	
Weight	**Grade**
Below 50%	F
50 – 55	D

56 – 62	D+
63 – 69	C
70 – 77	C+
78 – 84	B
85 – 90	B+
91 – 100	A

F- Available university services that support achievement in the course:

- The faculty labs
- The university labs
- The library and e-library

24. Required equipment:

The required equipment as provided by university services.

٢٥. References:

A- Required book (s), assigned reading and audio-visuals:

- **Compilers. Principles, Techniques and Tools by Aho, et al, Addison Wesley.**
- The Art of Compiler Design, theory and practice by Thomas Pittman and James Peters, Prentice-Hall, 1992**.**

B- Recommended books, materials, and media:

1-www.thefreecountry.com/**compilers**/index.shtml - Similar pages
2-www.bloodshed.net/**compilers**/ - 21k - Cached - Similar pages
3-.www.idiom.com/free-**compilers**/ - 12k - Cached - Similar pages

٢٦. Additional information:

- Average work-load student should expect to spend 6 hours per week.
- Participation in and contribution to class discussions will affect your final grade positively. Raise your hand if you have any question.
- Making any kind of disruption and (side talks) in the class will affect you negatively

Name of Course Coordinator: Prof. Riad Jabri -Signature: ---------- Date: ----------

Head of curriculum committee/Department: ---------- Signature: ----------

Head of Department: ---------- Signature: ----------

Head of curriculum committee/Faculty: ---------- Signature: ----------

Dean: ---------- -Signature: ----------

Copy to:
Head of Department
Assistant Dean for Quality Assurance
Course File