University/Academy: Arab Academy for Science and Technology & Maritime Transport
Faculty/Institute: College of Computing and Information Technology
Program: Computer Science / Software Engineering / Information Systems

Form No. (12)
Course Specification

1- Course Data

Course Code: CS321	**Course Title:** **Systems Programming**	**Academic Year/Level:** Year 3 / Semester 5
Specialization: Computer Science	**No. of Instructional Units:** 2 hrs lecture 2 hrs lab	**Lecture:**

2- Course Aim	Introduction To System Programming, Machine Architecture, Assembly Language, Machine Language, Two Pass Assemblers, One Pass Assemblers, Loaders, Linkers, Introduction To Formal Languages, Compilers and Interpreters.
3- Intended Learning Outcome:	
a- Knowledge and Understanding	**Students will be able to demonstrate knowledge of:** K18. Understand the fundamental topics in Computer Science, including hardware and software architectures, software engineering principles and methodologies, operating systems, compilers, parallel and distributed computing, systems and software tools. • Describe Intel machine architecture. • Understand the design of an assembler • Know how the assembler works • Understand design concepts of loaders • Understand design concepts of linkers • Identify compiler design concepts
b- Intellectual Skills	**By the end of the course, the student acquires high skills and an ability to understand:** **I15.** Restrict solution methodologies upon their results. • Decide what type of linking loader is suitable for environment used **I16.** Establish criteria, and verify solutions • Design 1-pass and 2-pass assembler **I17.** Identify a range of solutions and critically evaluate and justify proposed design solutions.

	• Evaluate compiler performance issues and code generation.

c- Professional Skills	**<u>By the end of the course the student will have the ability to:</u>** **P14.** Specify, design, and implement computer-based systems. • Write assembly programs. • Implement 1-pass and 2-pass assembler • Develop a compiler for a specific language **P15.** Evaluate systems in terms of general quality attributes and possible tradeoffs presented within the given problem. • Use X86 simulator. •
d- General Skills	**Students will be able to:** **G1.** Demonstrate the ability to make use of a range of learning resources and to manage one's own learning. **G2.** Demonstrate skills in group working, team management, time management and organizational skills. **G7.** Show the use of general computing facilities.
4- Course Content	1 Understand the architecture of a machine, its assembly language, macro language. 2 Program in assembly language. 3 Build the structure and design of assemblers, linkers and loaders. 4 Understand the concepts and theory behind the implementation of high- level programming languages through building a compiler/interpreter for a simple high-level language.
5- Teaching and Learning Methods	Lectures, Labs, Projects, Individual study & self-learning.
6- Teaching and Learning Methods for Students with Special Needs	• Students with special needs are requested to contact the college representative for special needs (currently Dr Hoda Mamdouh in room C504) • Consulting with lecturer during office hours. • Consulting with teaching assistant during office hours. • Private Sessions for redelivering the lecture contents. • For handicapped accessibility, please refer to program specification.
7- Student Assessment:	
a- Procedures used:	Exams and assignments

b- Schedule:	Week 7 exam Week 12 exam Weekly assignment Week 16Final exam
c- Weighing of Assessment:	7th week exam 30% 12th week exam 20% Assignment 10% Final exam 40%

8- List of References:

a- Course Notes	From the Moodle on www.aast.edu
b- Required Books (Textbooks)	A.A.Puntambekar, *System Programming*, Technical Publications; First edition , 2011
c- Recommended Books	1- John J. Donovan, *Systems Programming* , Central Book Co., 1979 2- David A. Watt, *Programming Language Processors* , Prentice Hall, 1993
d- Periodicals, Web Sites, …, etc.	

Course Instructor: **Head of Department:**

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