



University/Academy: Arab Academy for Science, Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: B.Sc. Computer Engineering

Form no. (12): Course Specification

1- Course Data

Course Code: CC410	Course Title: Systems Programming	Academic Year/Level: 4th year / 7th semester
Specialization: Computer Engineering	No. of Instructional Units 3	Lecture 2
		Practical 2

2- Course Aim

- Understand the architecture of a hypothetical machine, its assembly language, macro language.
- Programming in assembly language.
- The structure and design of assemblers, linkers and loaders.
- The concepts and theory behind the implementation of high level programming languages

3- Intended Learning Outcomes

a- Knowledge and Understanding	<p>Through knowledge and understanding, students will be able to:</p> <p>a5. Engineering principles in the fields of logic design, circuit analysis, machine and assembly languages, computer organization and architectures, memory hierarchy, advanced computer architectures, embedded systems, signal processing, operating systems, real-time systems and reliability analysis.</p> <ul style="list-style-type: none"> • Demonstrate the SIC machine architecture • Show how the assembler works • Understand the design option taken in any assembler <p>a6. Related research and current advances in the field of computer software and hardware and contemporary engineering topics.</p> <ul style="list-style-type: none"> • Decide what type of linking loader suitable for environment used • Understand, evaluate and design system software • Understand Compiler techniques
b- Intellectual Skills	<p>Through intellectual skills, students will be able to:</p> <p>b1. Select/Apply appropriate mathematical and computer-based methods for modeling and analyzing problems and select appropriate solutions for engineering problems based on analytical thinking.</p> <ul style="list-style-type: none"> • Discover : <ul style="list-style-type: none"> • The Design of 1-pass and 2-pass assembler • The Design Concepts of Loader • theDesign concepts of linker • How macros work • Compiler design concepts <p>b4. Assess and evaluate the characteristics and performance of components, systems and processes and investigate their failure.</p> <ul style="list-style-type: none"> • Evaluate compiler performance issues and code generation.
c- Professional Skills	<p>Through professional and practical skills, students will be able to:</p> <p>c3. Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment, wide range of analytical tools, techniques, and software packages pertaining to the computer engineering to design experiments, collect, analyze and interpret results and develop required computer programs.</p>

	<ul style="list-style-type: none"> • Write assembly programs • Use sic/xe simulator. <p>c9. Write computer programs on professional levels achieving acceptable quality measures in software development. Conduct user support activities competently.</p> <ul style="list-style-type: none"> • Write programs using macros . • Writing compiler for languages
d- General Skills	<p>Through general and transferable skills, students will be able to:</p> <p>d3. Demonstrate efficient IT capabilities.</p> <ul style="list-style-type: none"> • Sketch assembly programs

4- Course Content

Week No.1	Introduction to Systems Programming
Week No.2	Simplified Instructional Computer (SIC)
Week No.3	Sic and Sic/xe programming examples
Week No.4	Simple two pass assembler
Week No.5	Object code generation
Week No.6	Machine dependent assembler features
Week No.7	7th Week Exam +Revision
Week No.8	Machine Independent Assembler features (literals , symbols, expression)
Week No.9	One-pass assembler
Week No.10	Loader
Week No.11	Linker
Week No.12	12th Week Exam.+ Macros
Week No.13	Macros
Week No.14	Introduction to Compiler
Week No.15	Compiler design stages
Week No.16	Presentation of projects and Final Exam.

5- Teaching and Learning Methods

<ul style="list-style-type: none"> • Lectures • Tutorials • Reports & sheets • Laboratories • Seminars

6-Teaching and Learning Methods for Students with Special Needs

<ul style="list-style-type: none"> • Lectures • Tutorials • Reports & sheets • Laboratories • Seminars <p>The academic advisors of each student, as well as dedicated department TAs monitor the students' progress and solve any problem he/she may encounter.</p>
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7- Student Assessment

a-Procedures used	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, -----) to assess The Intellectual Skills.	
b- Schedule:	Assessment 1 Assessment 2 Assessment 3 Assessment 4	7 th Week Written Exam 12 th Week Written Exam Continuous 16 th Week Final Written Exam
c- Weighing of Assessment	7 th Week Examination 12 th Week Examination Final-term Examination Oral Examination Practical Examination Semester Work Total	30 % 20 % 40 % 00 % 00 % 10 % 100%

8- List of References:

a- Course Notes	
b- Required Books (Textbooks)	<ul style="list-style-type: none"> Leland L. Beck, <i>System Software: An Introduction to Systems Programming</i>, 3rd Edition, Addison Wesley, Longman Inc., 1997.
c- Recommended Books	<ul style="list-style-type: none"> John J. Donovan, <i>Systems Programming</i>, Central Book Co., 1979 David A. Watt, <i>Programming Language Processors</i>, Prentice Hall, 1993
d- Periodicals, Web Sites, etc.	

Course Instructor:
Dr. Wael Hosny

Program Manager:
Prof. Dr. Mohamad AbouEI-Nasr

Dean of College of Engineering and Technology of AASTMT

Executive Manager of Quality Assurance Center of AASTMT

Name: **Prof. Moustafa Hussein Aly**

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Signature:

Signature: