LAU
School of Arts and Sciences

Department of Computer Science & Mathematics

Course Number and Name	CSC320 – Computer Organization	**CSC320**
Course Coordinator	Haidar Harmanani	
Course Co-coordinator	Sanaa Sharafeddine	
Class Time and Location	TR 11:00 a.m. – 12:15 p.m., BB1307	
Credits and Contact Hours	3	
Semester	Spring 2015	

INSTRUCTOR
Name: Dr. Sanaa Sharafeddine
Email: sanaa.sharafeddine@lau.edu.lb
Office: Orme Gray 410
Office Hours: TR: 1:00 p.m. – 3:00 p.m. and W: 10:00 a.m. – 12:00 noon

CURRENT CATALOG DESCRIPTION
Overview of the history of the digital computer, representation of numeric data, introduction to digital logic, logic expressions and Boolean functions, logic functions minimization. Processor and system performance, Amdahl's law. Introduction to reconfigurable logic and special-purpose processors. Introduction to instruction set architecture, and microarchitecture. Processor structures, instruction sequencing, flow-of control, subroutine call and return mechanism, structure of machine-level programs, low level architectural support for high-level languages. Memory hierarchy, latency and throughput, cache memories: operating principles, replacement policies, multilevel cache, and cache coherency. Register-transfer language to describe internal operations in a computer, instruction pipelining and instruction-level parallelism (ILP), overview of superscalar architectures. Multicore and multithreaded processors.

COURSE PREREQUISITE
Co-requisites: CSC 245 – Objects and Data Abstraction, MTH 207 – Discrete Structures I.

TEXTBOOK
D. Patterson and J. Hennessy, *Computer Organization and Design: The Hardware/Software Interface, Revised* 4th Edition, Morgan Kaufman.

COURSE TYPE

Required ☒   **E**lective ☐   **S**elective **E**lective ☐

COURSE LEARNING OUTCOMES
CLO1. Students shall demonstrate an understanding of the internal organization of a computer system through assembly language.
CLO2. Students shall design and simulate the data path and the control unit of a simple computer based on an instruction set.
CLO3. Students shall demonstrate an understanding of pipelining including instruction sequencing, register value forwarding, data interlocking.
CLO4. Students shall demonstrate an understanding of the basic concepts of multiprocessor and multi-core designs.
CLO5. Students shall demonstrate an understanding of the history and possible future of the field necessary for staying at the forefront of computing systems development (life-long learning).

STUDENT OUTCOMES ADDRESSED IN THIS COURSE
SO1, SO3, SO4, SO5, SO6, SO7, SO8, SO9, SO10, SO11

COURSE GRADING AND PERFORMANCE CRITERIA
Midterm   35%
Final Exam   35%
Project/Assignments 30%

TOPICS COVERED IN THE COURSE

1. Introduction to computer design and technology (3 hours)
2. Instruction set principles and examples (9 hours)
3. Computer arithmetic (3 hours)
4. Modeling digital systems design behavior using register transfer level (6 hours)
5. Pipelining, advanced pipelining and instruction level parallelism (6 hours)
6. Memory Hierarchy Design (6 hours)
7. Storage Systems (3 hours)
8. Multi-core computing and clusters (6 hours)

ASSESSMENT PLAN FOR THE COURSE

Embedded assessment and/or scoring rubrics.

POLICY ON CHEATING AND PLAGIARISM

Students caught cheating on an exam receive a grade of zero on the exam in their first cheating attempt and receive a warning. Students caught cheating for the second time will receive a grade of "F" in the course and another warning. Plagiarism on assignments and project work is a serious offense. If plagiarism is detected, a student will be subject to penalty, similar to the cheating case, which ranges from receiving a zero on the assignment concerned to an "F" in the course in addition to a warning.

DEADLINES

Students who fail to submit their assigned work on time will receive a zero grade. Students are given one week after the grades are announced to request review of the correction of their exam paper or assigned work.

ATTENDANCE POLICY

1. Students are held responsible for all the material presented in the classroom, even during their absence.
2. Students who miss an exam are not automatically entitled to makeups. A grade of zero will be given on the missed exam until valid reasons (in writing) are presented and approved by the course instructor. Students should present their written reason within three days after the exam date; otherwise, it will not be accepted.
3. Students can miss no more than the equivalent of five weeks of instruction and still receive credit for that course.
4. Instructors have the right to impose specific attendance regulations in their courses, provided that the above-stated limit of absences is not exceeded, and the minimum number of absences allowed is no fewer than the equivalent of two weeks of classroom instruction, after the Drop and Add period.
5. Instructors will inform the Departments' Chairperson and the Office of the Dean of Students, of any prolonged unexplained absence.
6. Students who exceed the allowed number of absences must withdraw from the course; otherwise, the course grade will be recorded as "F" (NP).

WITHDRAWAL POLICY

1. A student who withdraws after the Drop/Add period and by the end of the 5th week of classes (10th day of classes for Summer Modules) will obtain a "WI" on that particular course. The student may process such request directly through the Registrar's Office.
2. A student who withdraws from a course between the 6th week and the end of the 10th week of classes (18th day of classes for Summer Modules) will receive either a "WP" or a "WF". "WP" or "WF" will be determined by the instructor based on the achieved academic performance in that course till the time of withdrawal.
3. The "WI" and the "WP" will not count as a repeat; whereas the "WF" will count as a repeat.
4. "WI", "WP" and "WF" will not count towards the GPA calculation.
5. The deadlines for "WI" or "WP"/"WF" are clearly stated on the revised academic calendar on the LAU website: http://www.lau.edu.lb/academics/calendar

WI is equivalent to Early withdrawal
WP is equivalent to Withdrawal/Pass
WF is equivalent to Withdrawal/Fail

Deadline for withdrawal from courses: April 9, 2015 (It is the student's responsibility to drop the course)

COURSE EVALUATIONS

Completion of the online course evaluations is required.