Courses Description

College: Engineering

Department: Computer Engineering

Couse ID: 408200   **Description:** Foundations of Computer Engineering

Full Course Description: Basic mathematical notions of sets, set operations, relations, functions, algebraic structures, logic, propositional logic, predicate logic, recursion, strong and weak induction, methods of proof, commonly occurring mathematical concepts: graphs, trees, queues. Introduction to computational complexity, theta and big-O notation, combinatorial analysis. Ordinary differential equations (first, second, and high order). Introduction to Laplace Transform. Relevance of these ideas to computer engineering.

Couse ID: 408211   **Description:** Object Oriented Programming

Full Course Description: Types of programming. Classes and subclasses, class hierarchies, data and program abstraction, decomposition of large systems into reusable objects, object identity, type constructors, encapsulation, inheritance, polymorphism, and versioning; Separation of behavior and implementation, modularity. Programming projects will be implemented in an object-oriented language such as JAVA and C++.

Couse ID: 408212   **Description:** Object Oriented Programming

Full Course Description: a

Couse ID: 408220   **Description:** Digital Logic

Full Course Description: Internal structure of computers, number systems and arithmetic, two's-complement arithmetic, binary addition/subtraction circuits, Boolean algebra, mapping techniques and function minimization, Logic gates, Logic equivalent circuits, structured system design procedures, synthesis of combinatorial circuits, analysis and synthesis of sequential circuits, and flip-flops. Clock generation circuits. Mealy and Moore models. Registers, counters, memory units; computer-aided design and logic simulation.

Couse ID: 408330   **Description:** Assembly Language and Microprocessors

Full Course Description: Introduction to ?-processors and ?-computers, software/hardware architecture of 8088-based ?-computer systems, assembly language and programming techniques for 8088/8086 ?-processor; Instruction set and addressing modes; Operating systems issues, memory address space, program development with MASM. Hardware architecture of 8088/86 ?-processors, memory subsystems, buses, registers, I/O subsystems, advances on the Pentium processor families.

Couse ID: 408331   **Description:** Microprocessors Lab

Full Course Description: Introduction to BGC 8088, debug commands, addressing modes and control flags, data transfer, 8284-clock generator, design of linear-select RAM-memory, 8-bit input / output ports, dynamic display, project.

Couse ID: 408332   **Description:** Assembly Language and Microprocessors

Full Course Description: a

Couse ID: 408333   **Description:** Microprocessors Lab.

Full Course Description: a

Couse ID: 408340   **Description:** Computer Organization

Full Course Description: Basic computer organization; Instruction set architecture, control and microcode, computer arithmetic, addressing modes; basic hardware and software structure, addressing methods, data and Instruction formats, programs control, design of a simple computer, processing unit organization and design, input/output organization, main-memory organization, peripherals, microprocessor families, machine instructions and programs, basic pipelining. Course project.

Courses Description

College: Engineering

Department: Computer Engineering

Couse ID: 408351   **Description:** Operating Systems

Full Course Description: Introduction to organization of operating systems, computer-system structures, operating-system structures, processes, process interaction and communication, threads and pthreads, CPU scheduling, process synchronization, deadlock problems and avoidance, memory management, virtual memory, buffering, sockets, distributed systems structures, file-system interface, file-system implementation, distributed file systems, sharing and protection of processes and data. Data space management. Examples of operating systems (UNIX and Windows XP). Course project.

Couse ID: 408360   **Description:** Modeling and Simulation

Full Course Description: Digital system modeling, modeling techniques. Simulation models; discrete and trace-driven simulations; data collection and analysis; random number generators, analysis of simulation output, performance optimization; analytic modeling; queuing theory and workload characterization, some course projects.

Couse ID: 408412   **Description:** Systems Programming

Full Course Description: Design and implementation of various system software components including assembler, macro processor, compiler, and loader; analysis of modern software engineering practice, methods for requirements specification, design, implementation, verification, and maintenance of large software systems; advanced software development techniques and large project management approaches; project planning, scheduling, resource management, accounting, configuration control, and documentation; special emphasis on technical writing.

Couse ID: 408413   **Description:** Client-Server and Distributed Computing

Full Course Description: Foundations of client-server computing and architectures for distributed object systems; architectural issues, systems planning, middleware and data access protocols, server technologies; homogeneous and heterogeneous distributed systems; object-oriented distributed system design, distributed directory services, atomic transactions and time synchronization, file access, and remote procedure call; distributed file systems and cache coherence; distributed objects, CORBA, DCOM, and ActivX; server design for reliability, availability, and scalability.

Couse ID: 408422   **Description:** Digital Integrated Circuits

Full Course Description: Analysis and design of digital integrated circuits, digital integrated circuit families, A/D and D/A conversions. Modeling MOS devices, SPICE models, clocked static circuits; dynamic logic; pre-charged logic. Device and circuit level optimization of digital building blocks. Fabrication and layout, invertor design, basic gates, high-speed CMOS design, dynamic logic circuits, interconnect design, memory design, clocks and power distribution, input/output design, bipolar digital circuits.

Couse ID: 408423   **Description:** Digital System Design

Full Course Description: Hardwired and stored logic paradigms for digital system implementation; the hardware description language (VHDL), configurable logic devices such as PLDs and FPGAs; system interconnection structures, bus arbitration schemes and data-link level bus communication protocols; architectural and operational aspects of general purpose central processing units (CPUs); an introduction to the use of programming languages (assembly and high-level) in the design of stored logic systems and related low-level issues such as the binding of program and data to memory; and memory and input/output organizations and interrupt mechanisms, power, area and delay optimizations; clocking schemes; power distribution

Courses Description

College: Engineering

Department: Computer Engineering

Couse ID: 408424	**Description:** VLSI Design

Full Course Description: a

Couse ID: 408432	**Description:** Microprocessor Based Systems

Full Course Description: Architecture of a microcomputer, software model of 8088/86 Microprocessor, the hardware architecture of 8088/86 microcomputer system, memory interface, Input/output interface circuits for 8088/86-based microcomputer, interrupt interface of the 8088/86 microprocessor, hardware of the original/IBM PC microcomputer, real-time software and hardware architecture of the 80286 microprocessor, interfacing to the external devices.

Couse ID: 408433	**Description:** Microprocessor Interfacing Lab

Full Course Description: Design and implementation of several interfacing tasks; interfacing with simple I/O devices using latches, buffers, and parallel adapters; parallel and serial interfacing to printers, scanners, and CRTs. Timer programming; A/D and D/A converters and data acquisition; host-to-host communication through parallel and serial links and modems; interfacing circuits of the theoretical course.

Couse ID: 408441	**Description:** Computer Architecture

Full Course Description: Memory hierarchy, cache, virtual memory organization for high performance machines; I/O architecture and interfacing. Control & microprogramming techniques. Processor architecture, controllers, buses, DMA. Performance and cost measurement considerations, distributed system models. Advanced pipelining techniques, processor implementation strategies, CISC and RISC, vector processors, single and multiple issue processors, VLIW, superscalar processors, special purpose components and devices; I/O and bus subsystems. Multiprocessor systems hardware description languages. Course project.

Couse ID: 408442	**Description:** Computer Maintenance Lab

Full Course Description: Overview of PCs and their peripherals like mouse, keyboard, digital pads, and other pointing devices; computer anatomy; motherboards and processors, memories, computer assembly; hardware compatibility and connectivity issues, computer faults troubleshooting, and diagnosing.

Couse ID: 408443	**Description:** Hardware/Software Integration

Full Course Description: Development of systems in computer engineering. Use of microprocessors as system components. Integration of hardware, software, and applications. Customization of computer systems for specific applications such as engineering, multi-media, or data acquisition, Input/output interfacing. Bus architectures and standard interfaces. Concept of a life cycle, life cycle models. Process and process improvement; support tools, standards and technologies for integration; hardware/software interface design, hardware/software design methodologies, special problems of hardware/software design tradeoffs; install and maintain various hardware and software components for specialized applications; and analyz

Couse ID: 408450	**Description:** Computer Networks

Full Course Description: Definitions, network architectures, OSI model, communication protocols, media access control protocols for shared channels. Routing algorithms. TCP/IP and client/server model, network topologies, local area networks, internetworking devices, high-speed bridged networks, wide area networks, introduction to Internet and TCP/IP, introduction to ISDN, DSL, and ATM networks. Switched networks, mobile/wireless networks. Performance analysis of computer networks: Queuing systems, throughput-delay analysis.

Courses Description

College: Engineering

Department: Computer Engineering

Couse ID: 408452	**Description:** Networks Security

Full Course Description: Overview of information assurance. Legal and ethical issues surrounding security and privacy. Concepts and techniques for access to computer systems and network resources; identification and authentication; protection of information against intentional and unintentional attacks and threats; cryptography and encryption of data; encryption algorithms and their information theory foundations; computer hardware and software for data encryption; IP security, Email security, Web security and SSL. Security in wireless networks. Current trends in network security.

Couse ID: 408453	**Description:** Networks and Operating Systems Lab

Full Course Description: Overview of information assurance. Legal and ethical issues surrounding security and privacy. Concepts and techniques for access to computer systems and network resources; identification and authentication; protection of information against intentional and unintentional attacks and threats; cryptography and encryption of data; encryption algorithms and their information theory foundations; computer hardware and software for data encryption; IP security, Email security, Web security and SSL. Security in wireless networks. Current trends in network security.

Couse ID: 408454	**Description:** Network Programming

Full Course Description: Basics of client/server programming using the Java and C# programming languages. Sockets, ports, network services, basics and fundamentals of programming network. Concepts of active networks: applications, security, safety, and architectures. Network devices programming using programmable packets, network control and management using programmable packets, network control and management programming, specific tools for network programming.

Couse ID: 408455	**Description:** Internet Engineering

Full Course Description: Internet technologies and protocols, design principles of the Internet protocols. Domain Name System (DNS), routing protocols, network management protocols application-level protocols. Role of TCP/IP in web development, Web proxies. Web servers and server farms. HTTP and web protocols. Web caching and content distribution. Load balancing. Web security and firewalls. Web workload and traffic characterization. Web concepts and applications, scripting languages; Active Server Pages (ASP). Some hand-on exercises.

Couse ID: 408461	**Description:** Real Time Systems

Full Course Description: Overview of real-time systems; design issues of real-time systems; programming language support; use of unified modeling language (UML), reliability and fault tolerance; time handling; exceptions and exception handling; concurrent programming; real time operating systems; scheduling; synchronization; real time communication; resource control; distributed systems; real-time engineering applications of computers to on-line control, communication systems and data acquisition. Course project.

Couse ID: 408462	**Description:** Embedded Systems

Full Course Description: Nature of embedded systems, particular problems of embedded systems, embedded microcontrollers, embedded software; real time systems, problems of timing and scheduling; testing and performance issues, reliability; low power computing, energy sources, leakage; design methodologies, software tool support for development of such systems; problems of maintenance and upgrade; networked embedded systems.

Courses Description

College: Engineering

Department: Computer Engineering

Couse ID: 408463   **Description:** Multimedia Systems and Networks

Full Course Description: Multimedia applications and requirements; multimedia traffic generation and characterization; audio compression; image and video compression standards; advances in networking technologies and protocols for multimedia applications; integrated services in the internet; network element, controlled load, and guaranteed QoS service specifications; integrated services over specific link layers; real-time transport protocol (RTP); audio-video conferencing standards; data conferencing standards; real-time streaming protocol (RTSP).

Couse ID: 408470   **Description:** Artificial Intelligence and Neural Networks

Full Course Description: Introduction to artificial intelligence, knowledge representation and reasoning, intelligent agents, problem solving and searching. Expert systems. Natural language processing. Overview of neuro-engineering technology; basic neural network architectures and algorithms; feedforward and feedback networks; supervised and unsupervised learning; learning by punish/reward; applications of neural networks. Exercises using MATLAB.

Couse ID: 408471   **Description:** Computer Vision and Image Processing

Full Course Description: Binary vision systems, grey scale and color vision systems, 3-D vision geometry of image formation, recognizing 3D objects from models, image perception; image sampling and quantization; image transforms; image representation, enhancement, filtering, restoration, and segmentation; image analysis and computer vision; image reconstruction from projections; image compression; edge detection; region extraction and representation; pattern recognition; fundamental issues and techniques of computer vision. Demonstrate a simple application of computer vision technology in a computer engineering context.

Couse ID: 408480   **Description:** Practical Training

Full Course Description: The BSc degree in Computer Engineering requires 8 weeks of continuous training inside Jordan, or six weeks of continuous training outside Jordan. The training must be conducted within private or public sectors working in the ECE fields, which requires the approval of the department. A final report is required.

Couse ID: 408490   **Description:** Special Topics in Computer Engineering

Full Course Description: This course covers recent topics in Computer Engineering taught by a visiting professor or a department faculty member.

Couse ID: 2408340   **Description:** Computer Organization

Full Course Description: a

Couse ID: 2408351   **Description:** Operating Systems

Full Course Description: a

Couse ID: 2408360   **Description:** Modeling and Simulation

Full Course Description: a

Couse ID: 2408412   **Description:** Systems Programming

Full Course Description: a

Couse ID: 2408432   **Description:** Microprocessor Based Systems

Full Course Description: a

Couse ID: 2408433   **Description:** Microprocessor Interfacing Lab.

Full Course Description: a

Courses Description

College: Engineering

Department: Computer Engineering

Couse ID: 2408454	**Description:** Networks Programming
Full Course Description: a	
Couse ID: 2408461	**Description:** Real Time Systems
Full Course Description: a	
Couse ID: 2408462	**Description:** Embedded Systems
Full Course Description: a	
Couse ID: 2408471	**Description:** Computer Vision and Image Processing
Full Course Description: a	
Couse ID: 110408213	**Description:** Data Structure
Full Course Description: a	
Couse ID: 110408220	**Description:** Digital Logic
Full Course Description: This course offers coverage of number systems and arithmetic, two's-complement arithmetic, binary addition/subtraction circuits, Boolean algebra, mapping techniques and function minimization, logic gates, logic equivalent circuits, structured system design procedures, synthesis of combinatorial circuits, analysis and synthesis of sequential circuits, and flip-flops. It also provides coverage to clock generation circuits, Mealy and Moore models, registers, counters and memory units.	
Couse ID: 110408221	**Description:** Digital Logic Lab
Full Course Description: a	
Couse ID: 110408240	**Description:** Computer Design and Organization
Full Course Description: This course is an introductory course on computer organization. It introduces the underlying concepts and principles of computer organization with emphasis computer components and interconnection, computer arithmetic, processer structure and function, instruction set, internal, and external memory.	
Couse ID: 110408300	**Description:** Algorithms
Full Course Description: This course is an introductory course to the design, implementation and analysis of computer algorithms. Topics covered include but not limited to the growth of functions, the time complexity of algorithms, recurrence relations and their solutions, the design and analysis of various sorting algorithms (insertion, merge, quick, and heap sort), linear sorts, search and hash tables, graph searching algorithms (breadth-first and depth-first search), dynamic programming, greedy algorithms, minimal spanning trees, single-source shortest path algorithms, and NP completeness (time allows).	
Couse ID: 110408303	**Description:** Fundamentals of Communications
Full Course Description: a	
Couse ID: 110408327	**Description:** Digital Electronics and Integrated Circuits
Full Course Description: 1	
Couse ID: 110408332	**Description:** Assembly Language and Microprocessor Systems
Full Course Description: This course offers coverage of both software and hardware aspects of Intel 8086/8088 microprocessor. Examine internal architecture, its operation and control, the organization and interface requirements for a microcomputer system. A study of its addressing modes, instruction sets, assembly language programming and programming problems including peripheral device service routines and arithmetic operations. There will be emphasis on coding assignment and demo the results.	
Couse ID: 110408340	**Description:** Computer Organization
Full Course Description: a	

Courses Description

College: Engineering

Department: Computer Engineering

Couse ID: 110408343	**Description:** Fundamentals of Computer Architecture

Full Course Description: This is an introductory course on Computer and Processor Architectures. The course will cover a range of topics in the area of computer architecture with the objective of providing an exposure to current and emerging trends in Computer Architectures, focusing on the performance and the hardware/software interface. The emphasis is on studying and analyzing fundamental issues in architecture design and their impact on performance. The course will have a mix of theory, hardware, and software --- it will not conduct in-depth case studies of different architectures.

Couse ID: 110408434	**Description:** Digital Logic and Microprocessors Lab

Full Course Description: This lab aims to provide students with a lab experience of digital logic and assembly language. This lab covers the following topics: logic gates, Boolean algebra, multiplexers, decoders, adders and comparators. Also, it's provide experiments to explore the architecture
of the 8086/8088 microprocessor and how to develop assembly programs.

Couse ID: 110408442	**Description:** Computer Maintenance Lab

Full Course Description: This lab gives an overview of PCs and their peripherals like mouse, keyboard, digital pads, and other pointing devices; computer anatomy; motherboards and processors, memories, computer assembly; hardware compatibility and connectivity issues, computer faults troubleshooting, diagnosing; Windows installation, administrative tools, and Software troubleshooting and diagnosing.

Couse ID: 110408450	**Description:** Computer Networks

Full Course Description: a

Couse ID: 110408454	**Description:** Computer Networking Lab

Full Course Description: a

Couse ID: 110408455	**Description:** Operating Systems

Full Course Description: a

Couse ID: 110408456	**Description:** Computer Security

Full Course Description: a

Couse ID: 110408457	**Description:** Wireless Networks

Full Course Description: a

Couse ID: 110408480	**Description:** Practical Training

Full Course Description: The B.Sc. degree in Computer Engineering requires 8 weeks of continuous training inside or outside Jordan. The training must be conducted within private or public sectors working in the computer engineering field, which requires the approval of the department. A final report is required.

Couse ID: 110408520	**Description:** Analog Integrated Circuits

Full Course Description: a

Couse ID: 110408522	**Description:** Digital Systems Design

Full Course Description: 1

Couse ID: 110408553	**Description:** Wireless Networks Security and Protocols

Full Course Description: a

Couse ID: 110408557	**Description:** Internet Protocols

Full Course Description: a

Courses Description

College: Engineering

Department: Computer Engineering

Couse ID: 110408560	**Description:** Networks Modeling and Simulation
Full Course Description: a	
Couse ID: 110408565	**Description:** Real-Time Systems
Full Course Description: a	
Couse ID: 110408576	**Description:** Design of Testability
Full Course Description: a	
Couse ID: 110408577	**Description:** VLSI Systems
Full Course Description: a	
Couse ID: 110408578	**Description:** Implementation of Digital Signals Processing Systems
Full Course Description: a	
Couse ID: 110408591	**Description:** Graduation Project (1)
Full Course Description: a	
Couse ID: 110408592	**Description:** Graduation Project (2)
Full Course Description: a	
Couse ID: 110408593	**Description:** Special Topics in Computer Engineering
Full Course Description: This course covers recent topics in Computer Engineering taught by a visiting professor or a department faculty member.	
Couse ID: 150408480	**Description:** Practical Training
Full Course Description: ↵	
Couse ID: 1704081561	**Description:** Information Systems and Network Infrastructure Protection
Full Course Description: l	
Couse ID: 1704081572	**Description:** Cryptographic Systems
Full Course Description: d	
Couse ID: 1704081580	**Description:** Multimedia Systems and Networks
Full Course Description: Multimedia applications and requirements; multimedia traffic generation and characterization; audio compression; image and video compression standards; advances in networking technologies and protocols for multimedia applications; integrated services in the internet; network element, controlled load, and guaranteed QoS service specifications; integrated services over specific link layers; real-time transport protocol (RTP); audio-video conferencing standards; data conferencing standards; real-time streaming protocol (RTSP).	
Couse ID: 1704081581	**Description:** Computer Vision
Full Course Description: This class provides a survey of modern computer vision topics focusing on the geometric aspects. Topics covered include introduction to the array representation of images, quick introduction on linear algebra fundamentals, representation of different geometric entities in both 2D and 3D, concepts of camera geometry, feature extraction, and machine learning (time allowed). Programming assignments and final course project using C/MATLAB will be given to enrich the understanding of the course topics.	
Couse ID: 1704081582	**Description:** Parallel Computing
Full Course Description: Topics include principles and practice of parallel computing; parallel program design; implementation and evaluation of parallel programs for shared memory systems; GPU programming.	

Courses Description

College: Engineering

Department: Computer Engineering

Couse ID: 1704081584	**Description:** Advanced Programming

Full Course Description: In-depth discussion of the following topics using Java language :
• object-oriented programming concepts such as inheritance, interfaces, abstract classes, abstract methods, and polymorphism
• lists, stacks, queues
• sorting and search algorithms
• Graphical user interface
Also, discuss other advanced topics such as
• Scripting language (e.g., Python)

Couse ID: 1704081585	**Description:** Digital Image Processing

Full Course Description: This is an introductory course on Digital Image Processing. The course will cover a range of Image Processing topics. The emphasis is on providing an introduction to digital image processing techniques for enhancement, compression, restoration, reconstruction, and analysis, so that, in the future, the students will be able to readily apply their knowledge in industry or research or further enhance it by self study.

Couse ID: 1904081505   **Description:** Hardware Computer Security

Full Course Description:

Couse ID: 2004081480   **Description:** Practical Training

Full Course Description:

Couse ID: 2104081311   **Description:** Object-Oriented Programming

Full Course Description:

Couse ID: 2104081314   **Description:** Computer Applications Lab

Full Course Description:

Couse ID: 2104081374   **Description:** Artificial Intelligence and Machine Learning

Full Course Description:

Couse ID: 2104081410   **Description:** Data and Systems Science

Full Course Description:

Couse ID: 2104081423   **Description:** VLSI Design

Full Course Description:

Couse ID: 2104081458   **Description:** Computer Digital Forensics

Full Course Description:

Couse ID: 2104081511   **Description:** Data Mining Principles

Full Course Description:

Couse ID: 2104081512   **Description:** Big Data

Full Course Description:

Couse ID: 2104081562   **Description:** Software Reverse Engineering

Full Course Description:

Couse ID: 2104081566   **Description:** Concurrent and Distributed Systems

Full Course Description:

Couse ID: 2104081573   **Description:** Networks and Internet Security

Full Course Description:

Courses Description

College: Engineering

Department: Computer Engineering

Couse ID: 2304081326	**Description:** Embedded System Lab
Full Course Description:	
Couse ID: 2304081330	**Description:** Computer Organization
Full Course Description:	
Couse ID: 2304081333	**Description:** Microprocessors Lab
Full Course Description:	
Couse ID: 2304081362	**Description:** Embedded Systems
Full Course Description:	
Couse ID: 2304081415	**Description:** Introduction to Software
Full Course Description:	
Couse ID: 2304081433	**Description:** Microprocessors and Embedded Systems
Full Course Description:	
Couse ID: 2304081443	**Description:** Computer Architecture
Full Course Description:	
Couse ID: 2304081510	**Description:** Systems Programming
Full Course Description:	
Couse ID: 2304081530	**Description:** Microprocessors Based Systems
Full Course Description:	