ساعات المحاضرات لكل مقرر ساعتين أسبوعياً لمدة 28 أسبوعاً موزعة على مدار العام الدراسى.

مقررات السنة التمهيدية للماجستير تخصص علوم الحاسب* (Computer Science)


ملحوظة:- للاطلاع على توصيف المقرر اضغط على اسم المقرر

الكود	اسم المقرر	Course Title	ساعات الدراسة الاسبوعية	النهاية العظمى للدرجات	ساعات الامتحان التحريرى
CS611	ضغط البيانات	Data Compression	2	**100**	3
CS612	هندسة البرمجيات الشيئية	Object-Oriented Software Engineering	2	**100**	3
CE611	معماريات الحاسبات الحديثة	Modern Computer Architecture	2	**100**	3

مقرر اختيارى (1)	(Elective Course (1	2	**100**	3
مقرر اختيارى (2)	(Elective Course (2	2	**100**	3
	إجمـــــــــــــالى	10	**500**	

- **مقرر اختيارى (1)** **(Elective Course (1**

يختار الطالب بالتنسيق مع القسم المختص واحداً من المقررات التالية:

تصميم واجهات المستخدم	User Interface Design	CS613
فاعلية واستخدامية البرمجيات	Software Reliability and Reusability	CS614
صيانة البرمجيات	Software Maintenance	CS615

- **مقرر اختيارى (2)** **(Elective Course (2**

يختار الطالب بالتنسيق مع القسم المختص واحداً من المقررات التالية:

تصميم لغات البرمجة	Programming Language Design	CS616
تقنيات المترجمات للنظم المتوازية	Compiling Techniques for Parallel Systems	CS617
موضوعات متقدمة فى علوم الحاسب	Advanced Topics In Computer Science	CS618
الحاسبات المتسامحة الأخطاء	Fault-Tolerant Computers	CS619

Data Compression

Background on signals, information theory, transforms, human vision, and metrics. Lossless and lossy compression techniques. Video compression. Compression standards. Progressive transmission.

CS612 **Object-Oriented Software Engineering** **هندسة البرمجيات الشيئية**

Introduction to software engineering concepts, methodologies and tools. Requirement analysis, design and implementation of object-oriented software development process. Students will be presented with several real-life examples and homework projects to cover all aspects of object-oriented lifecycle, from requirements to coding in C++.

CS613 **User Interface Design** **تصميم واجهات المستخدم**

Issues, information sources, and methods used in the design, implementation, and evaluation of user interfaces, the parts of software systems designed to interact with people. The psychological capabilities of the human are investigated and accounted for in design. Emphasizes how the design of the user interface is incorporated into the software life cycle.

CS614 **Software Reliability and Reusability** **فاعلية واستخدامية البرمجيات**

This course discusses principles of reliability, reusability, initiatives, and standards in software engineering, such as function point as a measure of complexity and, hence, reliability. The course provides an overview of software reliability models, software fault-tree analysis, types of software errors, types of design errors, and inherent characteristics of software that determine reliability. Software redundancy, automating tools for software reliability prototypes, and real-time software reliability are also covered.

CS615 **Software Maintenance** **صيانة البرمجيات**

This course provides a guide for the transition from programming for the short term to programming for the long term. The role of creation and maintenance in the software development process as well as analysis and implementation of a software design are reviewed. The need for software maintenance and evolution, software maintenance process and performance issues, planning for extended software life, and effective mechanisms to control software change are additional topics of discussion.

CS616 **Programming Language Design** **تصميم لغات البرمجة**

This course discusses the fundamental concepts and general principles underlying current programming languages and models. Topics include control and data abstractions, language processing and binding, indeterminacy and delayed evaluation, and languages and models for parallel and distributed processing. A variety of computational paradigms are discussed: functional programming, logic programming, object-oriented programming and data flow programming.

CS617 **Compiling Techniques for Parallel Systems** **تقنيات المترجمات للنظم المتوازية**

This course will study techniques used in the design of parallelizing compilers. Techniques for computing dependencies and program representations suitable for parallelizing software will be presented. Topics will include detection of fine and coarse parallelism, program transformations and scheduling techniques to exploit parallelism on shared and distributed memory architectures, and techniques for debugging parallel software.

CS618 **Advanced Topics in Computer Science** **موضوعات متقدمة فى علوم الحاسب**

This course focuses on the nondesign aspects of software engineering. Topics may include requirements specification, software quality assurance, software project management and software maintenance.

CS619 **Fault-Tolerant Computers** **الحاسبات المتسامحة الأخطاء**

Introduces a variety of hardware and software techniques for designing and modeling fault-tolerant computers. Topics include coding techniques (Hamming, SECSED, etc); majority voting schemes (TMR); software redundancy (N-version programming); software recovery schemes; network reliability design and estimation. Introduces probabilistic methods for reliability modeling. Examples from space fault-tolerant systems, networks, commercial nonstop systems (TANDEM and STRATUS). RAID memory systems. Fault-tolerant modeling tools such as HARP, SHURE and SHARPE.

INF611 **Theory of Information Systems Design** **نظرية تصميم نظم المعلومات**

Investigation of different architectural strategies for building object-oriented information systems. Develop familiarity with modeling, design and implementation techniques used in the construction of object-oriented information systems.

INF612 **Information Systems for Business Management** **نظم المعلومات فى إدارة الأعمال**

A study of the use of information systems to assist management in planning, directing, and controlling the activities of an organization. The use of computer resources in providing useful information for each of the functional areas of business is explored.

INF613 **Advanced Database Organization** **تنظيم قواعد البيانات المتقدم**

Study of relational, semantic, and object-oriented data models and interfaces. Database management system techniques for query optimization, concurrency control, recovery management and distributed processing.

INF614 **Information Retrieval** **استرجاع المعلومات**

Overview of fundamental issues of information retrieval with theoretical foundations. Comprehensive survey of information-retrieval techniques and theory, covering both effectiveness and run-time performance of information-retrieval systems. The focus is on algorithms and heuristics used to find documents relevant to the user request and to find them fast.

INF615 **Information Systems Applications** **تطبيقات نظم المعلومات**

In this course student teams design and implement a usable information system for a client organization in the community. The client organization may be affiliated with the university, government, business, or non-profit agency. Student teams will produce operational, fully documented and tested, computer-based information systems solutions for their clients.

INF616 **Decision Technology Systems** **النظم التكنولوجية لاتخاذ القرار**

A broad overview of decision-making and the systems that are designed to support the process. The management process, computer support for management, the technology of management, decision technology system types, including artificial intelligence, decision support systems, executive and

geographic information systems, and idea processing systems, system architectures, system integration considerations, system design and development methodologies, system performance measurement and evaluation, management of decision technology systems, organizational and user issues.

IT611 **Computer Forensics** **مناظرات الحاسب**

The theory, skills, and tools needed in intrusion detection and computer forensics are the major themes in this course The course discusses techniques for identifying vulnerable target systems and types of malicious code, for mitigating security risks, and for recognizing attack patterns. It also presents the conceptual and operational tools necessary for analysis and resolution of problems with respect to effective filters and firewalls, attack tracing, system recovery, continuity of operation, evidence collection, evidence analysis, and prosecution.

IT61 2 **Security in Distributed Systems and Networks** **أمن النظم الموزعة والشبكات**

Threats and couther measures in centralized and distributed systems; communication security techniques based on encryption; symmetric and asymmetric encryption; encryption modes, including stream and block encryption, and cipher-block chaining; message origin and mutual authentication; third-party and inter-realm authentication; authentication of mobile users; data confidentiality and integrity protocols; formal analysis of authentication protocols and message integrity; access control in distributed systems and networks; firewall design; case studies of security mechanisms and policies.

IT613 **Client/Server Applications Development** **تطوير تطبيقات العميل/ الخادم**

A client/server system using a database and client software will be implemented as the primary focus of this course. Topics associated with building software products, such as interactive help systems, graphical user design, and user-manual construction, will be covered.

IT614 **Distributed Multimedia Systems** **نظم الوسائط المتعددة الموزعة**

The emphasis of this course is on modeling and design of distributed multimedia systems. A framework is presented for data management, multimedia information management, knowledge management, communications management, activities management, interface management and applications to distributed systems, real-time systems, multimedia systems and information retrieval systems design.

IT615 **Software Systems for Data Communications** **نظم البرمجيات لتبادل البيانات**

Structure of software systems supporting communications among computing devices having diverse processing and communication capabilities; characterization of data communications software in terms of unified network architectures consisting of several functional layers; evaluation of several network architectures.

IT616 **Advanced Topics in Computer Networks** **موضوعات متقدمة فى شبكات الحاسب**

This course focuses on advanced topics in high-speed, integrated networks. Topics include service and traffic types, traffic characterization, access control and traffic policing, switching, traffic bounds and effective capacity, congestion control strategies, and performance analysis of high-speed integrated networks.

IT617 **Collaborative Multimedia Computing** **حسابات الوسائط المتعددة التبادلية**

Characteristics, treatment, and transmission of multimedia data. Design of point-to-point, multipoint, and broadcast networks for specific multimedia applications. Projected oriented.

IT618 **Virtual Reality Systems** **نظم الواقع الافتراضى**

Design and implementation of software systems necessary to create virtual environments; techniques for achieving realtime, dynamic display of photorealistic, synthetic images; hands-on experience with electromagnetically tracked, headmounted displays. Final project requires the design and construction of a virtual environment

CE611 **Modern Computer Architectures** **معماريات الحاسبات الحديثة**

This course examines the structure of modern computer systems. We explore hardware and technology trends that have led to current machine organizations, then consider specific features and their impact on software and performance. These may include superscalar issue, caches, pipelines, branch prediction, and parallelis