

## شروط الالتحاق بقسم هندسة البرمجيات

يجب على الطالب إنجاز 45 وحدة دراسية متضمنة مادة " مقدمة في هندسة البرمجيات " ITGS213 بمعدل لا يقل عن 60%

## المقررات الدراسية التخصصية لقسم هندسة البرمجيات

اثنا عشر مقرا تمثل متطلبات التخصص الإجبارية وخمس مقررات متطلبات القسم الاختيارية ومشروع التخرج

متطلبات القسم الاختيارية

الاسيقيات	اسم المقرر بالانجليزية	اسم المقرر	رمز المقرر
ITGS211	Logic Programming	برمجة المنطق	ITSE301
ITGS301, ITGS228	Data Mining	تنقيب البيانات	ITSE302
ITGS217, ITMM122, ITSE301	Modeling for Complex Systems	نمذجة الأنظمة المركبة	ITSE303
ITGS226, ITSE322	Mobile Applications Development	تطوير التطبيقات الجواله	ITSE304
	Special Topics	مواضيع مختارة	ITSE305
ITGS217, ITSE322, ITSE413	Principles of Games Development	مبادئ تطوير الألعاب	ITSE401
	Faculty Free Elective	اختيار الكلية الحر	ITSE402
	University Free Elective	اختيار الجامعة الحر	ITSE403
ITSE413, ITGS226	Principles of Multimedia	مبادئ الوسائط المتعددة	ITSE404
ITGS302, ITSE322	Network Programming	برمجة الشبكات	ITSE405

الاسيقيات	اسم المقرر بالانجليزية	اسم المقرر	رمز المقرر	
ITGS220	Design and Analysis of Algorithms	تصميم وتحليل الخوارزميات	ITGS301	الفصل الخامس
ITGS213	Software Requirements Analysis	تحليل متطلبات البرمجيات	ITSE311	
ITGS228	Advanced Database	قواعد البيانات المتقدمة	ITSE312	
	IT Project Management	إدارة مشاريع تقنية المعلومات	ITGS303	

	Elective 1	اختياري 1		
	Elective 2	اختياري 2		
	Operating Systems	نظم تشغيل	ITGS302	الفصل السادس
ITEL121	Scientific Writing	الكتابة العلمية	ITGS304	
ITGS213, ITGS217, ITGS220, ITGS301, ITGS211	Software Construction	بناء البرمجيات	ITSE321	
ITGS211	Modern Programming Language (Java)	لغة برمجة حديثة (جافا متقدمة)	ITSE322	
	Elective 3	اختياري 3		
	Elective 4	اختياري 4		
ITSE321, ITSE311	Software Design and Architecture	تصميم وهيكلة البرمجيات	ITSE411	
ITGS226, ITGS228	Advanced Internet programming	برمجة الانترنت المتقدمة	ITSE412	
ITGS213	Human and Computer Interaction	تفاعل الإنسان والحاسوب	ITSE413	
ITSE311	Software Engineering Ethics	إخلاقيات هندسة البرمجيات	ITSE414	
	Elective 5	اختياري 5		
ITGS303	BSc Project	مشروع التخرج	ITSE500	
ITSE321	Software Quality Assurance and Testing	جودة واختبار البرمجيات	ITSE421	الفصل الثامن
ITSE321, ITGS211	Software Reuse and Component-Based SE	اعادة استخدام البرمجيات وهندسة البرمجيات المقولبة	ITSE422	
ITGS211	Visual Programming	البرمجة المرئية	ITSE423	
ITGS211, ITSE411	Software Design Patterns	أنماط تصميم البرمجيات	ITSE424	
ITGS303	BSc Project	مشروع التخرج	ITSE 500	

توصيف المقررات الدراسية لقسم هندسة البرمجيات:

1.المقررات الإلزامية:

Course title	Software Requirements Analysis		
Course code	ITSE311	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>
Prerequisites	ITGS213		
Department	Software Engineering		
<p>Course Description:</p> <p>This course aims at the study of methods, tools, notations, and validation techniques for the analysis and specification of software requirements. Covered topics include: Techniques for gathering requirements; representation Languages and Models; Analysis and validation techniques; Requirements in the context of system engineering; Specifying and measuring external qualities: performance, reliability, availability, safety, security, etc; Requirements documentation standards; Traceability; Human factors; Requirements in the context of agile processes; Requirements management; Handling requirements changes.</p>			

Course title	Advanced Database		
Course code	ITSE312	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>
Prerequisites	ITGS228		
Department	Software Engineering		
<p>Course Description:</p> <p>The course aims for the students to be able to develop scalable, distributed applications with SQL to meet organizational requirements. Contents of this subject: Data definition; Managing Tables with DDL; Creating schemas; Referencing schemas versus using the default schema; hiding schemas with synonyms; Building tables; Adding and enforcing constraints; Declaring variables and parameters; Creating and utilizing local variables; Passing input and output parameters; Calling built-in scalar functions; Converting data using CAST and CONVERT; Ordering data with ranking functions; Maintaining Data; Modifying data; Creating Views; Stored Procedures and Stored procedure compilation and execution; Auditing and implementing constraint on data by the means of Triggers; Handling errors.</p>			

Course title	Software Construction		
Course code	ITSE321	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>
Prerequisites	ITGS213, ITGS217, ITGS220, ITGS301		
Department	Software Engineering		
<p>Course Description:</p> <p>General principles and techniques for disciplined low-level software design. BNF and basic theory of grammars and parsing. Use of parser generators. Basics of language and protocol design. Formal languages. State-transition and table-based software design. Formal methods for software construction. Techniques for handling concurrency and inter-process communication. Techniques for designing numerical software. Tools for model-driven construction. Introduction to Middleware.</p>			

Course title	Modern Programming Language (Advanced Java)		
Course code	ITSE322	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>
Prerequisites	ITGS211		
Department	Software Engineering		
<p>Course Description:</p> <p>To enable the students to design and develop enterprise strength distributed and multitier applications – Using Java Technology. A continuation of advanced Java programming techniques such as network programming, advanced graphical functions, JDBC, Swing, JavaBeans, Servlets and JavaServer Pages will be introduced.</p>			

Course title	Software Design and Architecture		
Course code	ITSE411	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>
Prerequisites	ITSE321		
Department	Software Engineering		
<p>Course Description:</p> <p>This course offers an in-depth look at software design. Continuation of the study of design patterns, frameworks, and architectures. Survey of current middleware architectures. Design of distributed systems using middleware. Component based design. Measurement theory and appropriate use of metrics in design. Designing for qualities such as performance, safety, security, reusability, reliability, etc. Measuring internal qualities and complexity of software. Evaluation and evolution of designs. Basics of software evolution, reengineering, and reverse engineering.</p>			

Course title	Advanced Internet programming		
Course code	ITSE412	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>
Prerequisites	ITGS226		
Department	Software Engineering		
<p>Course Description:</p> <p>A second Internet programming course concentrating on advanced Internet application development. Creation of relatively sophisticated web pages and application that allow interactions</p>			

between web page users and the web page as well as network programming, JDBC, XML processing are the main focus of the course. Different Internet programming language (JavaScript, jQuery, PHP) and tools will also be covered.

Course title	Human and Computer Interaction		
Course code	ITSE413	Credits	3
Course type	Core	Compulsory	Elective
Prerequisites	ITGS213		
Department	Software Engineering		
<p style="text-align: right;">Course Description:</p> <p>Students will learn the fundamental concepts of human-computer interaction and user centered design thinking, through working in teams on an interaction design project, supported by lectures, readings, and discussions. They will learn to evaluate and design usable and appropriate software based on psychological, social, and technical analysis. They will become familiar with the variety of design and evaluation methods used in interaction design, and will get experience with these methods in their project. Topics will include usability and affordances, direct manipulation, systematic design methods, user conceptual models and interface metaphors, design languages and genres, human cognitive models, physical ergonomics, information and interactivity structures, and design tools and environments.</p>			

Course title	Software Engineering Ethics		
Course code	ITSE414	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>
Prerequisites	ITSE311		
Department	Software Engineering		
<p style="text-align: right;">Course Description:</p> <p>The course gives an insight into the ethical problems important for professionals in Software Engineering and Computer Applications. It forms a framework in which professional and ethical issues can be analyzed, and builds up an awareness of various views of ethical issues and the ethical responsibilities of professionals.</p> <p>The topics include, among others: Fundamental moral theories of Engineering ethics; the social context of a profession; conflicts between loyalties to different principles such as safety and economy; precautionary principle and environmental impact; integrity; privacy; ownership; etc.</p>			

Course title	Software Quality and Testing		
Course code	ITSE421	Credits	3
Course type	Core	Compulsory	Elective

Prerequisites	ITSE321		
Department	Software Engineering		
<p style="text-align: right;">Course Description:</p> <p>This course shows how to define software quality and how it is assessed through various testing techniques it is intended to acquaint the students with principles, techniques and best practices of software quality assurance concentrating on software testing and verification. It will cover functional testing, structural testing, regression testing, test automation, specification based testing, code review.</p>			

Course title	Visual Programming		
Course code	ITSE423	Credits	3
Course type	Core	Compulsory	Elective
Prerequisites	ITGS211		
Department	Software Engineering		
<p style="text-align: right;">Course Description:</p> <p>This course introduces visual programming, the design and implementation of programs that utilize a visual user-interface. Topics covered will include: use of Microsoft Visual Studio for designing the interface; the message/event driven programming model, , audio and visual programming concepts, and will provide the framework to explore artistic programming projects; logical structure of the program (e.g. separating interface from “business logic”); control containers (e.g. graphics, dialogs, forms); and controls (e.g. button, slider, edit box.) Programming will be done in Visual Studio, which the student should have installed and operational on the first day of class.</p>			

Course title	Software Design Patterns		
Course code	ITSE424	Credits	3
Course type	Core	Compulsory	Elective
Prerequisites	ITGS211	ITSE411	
Department	Software Engineering		
<p style="text-align: right;">Course Description:</p> <p>This course aims to introduce the student to how to build a good object design. It teaches tools that help software engineering students learn core skills in object-oriented design that are essential for the creation of well-designed, robust, and maintainable software using object technologies and languages such as Java, C++, and C#. The essential material of the course is on design patterns; however the course includes applying the Unified Modeling Language (UML), and the Unified Process.</p>			

Course title	Logic Programming		
Course code	ITSE301	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input type="checkbox"/>	Elective <input checked="" type="checkbox"/>
Prerequisites	ITGS211		
Department	Software Engineering		
<p>Course Description: The course provides an introduction to Logic Programming. Topics Include: the syntax and the semantics of Prolog; Prolog interpreter; problem solving in AI; Prolog database querying, parsing, meta-programming; List Processing; Controlling Backtracking; Definite Clause Grammars; Practical Applications; Semantic Web and Logic Programming.</p>			

2.المقررات الاختيارية:

Course title	Data Mining		
Course code	ITSE302	Credits	3
Course type	Core	Compulsory	Elective
Prerequisites	ITGS301	ITSE312	
Department	Information Systems		
<p>Course Description:</p> <p>This course will define the notion of Business Intelligence and its components. It will change the way students think about data and its role in business. The goal of the course is to examine how data mining technologies can be used to improve decision-making. The topics will be covered include, Introduction to data mining and data mining process (identify business problem, build mining database, prepare data for modelling, build and evaluate model); Predictive Modelling; Descriptive/ Unsupervised Data Mining; Data Mining for business applications; Data mining and electronic commerce, Data warehousing: concepts and techniques; Data Warehouse Architecture; Data Warehousing to improve decision-making in business.</p>			

Course title	Modeling for Complex Systems		
Course code	ITSE303	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input type="checkbox"/>	Elective <input checked="" type="checkbox"/>
Prerequisites	ITGS217	ITMM122	ITSE301
Department	Software Engineering		
<p>Course Description: This course introduces the student to computational techniques used for modeling and applications of complex real-world systems, and studies their temporal and spatial evolution. This course includes: complex systems; autonomous components; agent based modeling; stochastic simulation; species/activity modeling; use of system investigation tools.</p>			

Course title	Mobile Applications Development		
Course code	ITSE304	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input type="checkbox"/>	Elective <input checked="" type="checkbox"/>
Prerequisites	ITSE322	ITGS226	
Department	Software Engineering		
<p>Course Description:</p> <p>This course is concerned with the development of applications on mobile and wireless computing platforms. Any mobile platform (Android, iOS, and Windows 8) could be used as a basis for teaching programming techniques and design patterns related to the development of standalone applications and mobile systems.</p> <p>Emphasis is placed on the processes, tools and frameworks required to develop applications for current and emerging mobile computing devices. Students will work at all stages of the software development life-cycle from inception through to implementation and testing. In doing so, students will be required to consider the impact of user characteristics, device capabilities, networking</p>			

infrastructure and deployment environment, in order to develop software capable of meeting the requirements of stakeholders.

Course title	Software Reuse and Component-Based SE		
Course code	ITSE422	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input type="checkbox"/>	Elective <input checked="" type="checkbox"/>
Prerequisites	ITSE321	ITSE322	
Department	Software Engineering		
<p>Course Description:  The course aims at introducing the students to the methods and techniques for constructing large-scale software systems from preexisting components; Topics include: Market versus technology; Component standards; component definition; Components interfaces and re-entrance; Aspects of scale and granularity; Patterns, frameworks, architectures; Reusing design patterns; Common Object Request Broker Architecture (CORBA); Java Beans; Enterprise Java Beans (EJB); Component development; Component distribution, acquisition and assembly.</p>			

Course title	Special Topics		
Course code	ITSE305	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input type="checkbox"/>	Elective <input checked="" type="checkbox"/>
Prerequisites			
Department	Software Engineering		
<p>Course Description:  This course is a topic or a collection of topics selected by the department according to the current developments in technology, curriculum, and job market.</p>			

Course title	Principles of Games Development		
Course code	ITSE401	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input type="checkbox"/>	Elective <input checked="" type="checkbox"/>
Prerequisites	ITGS211	ITSE322	ITSE413
Department	Software Engineering		
<p>Course Description: The course provides an introduction to the core concepts involved in designing and programming computer games. Subjects covered are: graphics; sprites, threads, sound; 2D platform games; 3D graphics; interaction and animation; lighting.</p>			

Course title	Faculty Free Elective		
Course code	ITSE402	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input type="checkbox"/>	Elective <input checked="" type="checkbox"/>
Prerequisites			
Department	Software Engineering		



Course Description:
This course is a subject chosen by the student from amongst subjects are being thought by other department in the Faculty.

Course title	University Free Elective		
Course code	ITSE403	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input type="checkbox"/>	Elective <input checked="" type="checkbox"/>
Prerequisites			
Department	Software Engineering		
Course Description:			
This course is a subject chosen by the student from amongst subjects are being thought by other Faculties in the University.			

Course title	Principle of Multimedia		
Course code	ITSE404	Credits	3
Course type	Core <input type="checkbox"/>	Compulsory <input type="checkbox"/>	Elective <input checked="" type="checkbox"/>
Prerequisites	ITSE413	ITGS226	
Department	Software Engineering		
Course Description:			
The course is a basic grounding in issue surrounding multimedia design, implementation and multimedia data. It enhances the student's view about graphics and images. The course will cover the following: digital audio, graphics, still images and videos, animation. Also it includes data compression and transmission of media, as well as software tools used for integrating digital media.			

Course title	Network Programming		
Course code	ITSE405	Credits	3
Course type	Core	Compulsory	Elective
Prerequisites	ITGS302	ITSE322	
Department	Software Engineering		
Course Description:			
In this course, students will learn how to write applications in Java that make use of network programming. This course covers the following topics: Introduction to network programming,			

Transport Layer Protocols, User Datagram Protocol, Client-Server Model, TCP Sockets, UDP Sockets; Sctp Sockets; Java's input/output system and how it works; Multicast Sockets implementation; client/server implementations; Threads Programming; multi-threaded applications; Multiplexing and De-multiplexing Applications; Implementing Application Protocols; Distributed computing technologies including remote method invocation, plus small project that addresses different departments disciplines.