الخطة الدراسية لبرنامج

"الدبلوم البريطاني"

في

هندسة البرمجيات

تتكون الخطة الدراسية لنيل الدرجة الجامعية المتوسطة في برنامج الدبلوم البريطاني/ تخصص **هندسة البرمجيات** من (68) ساعة معتمدة، موزعة على النحو الآتي:

الرقم	المتطلب	ساعة معتمدة
.1	متطلب كلية	11
.1	المهارات المساندة	12
.4	متطلبات التخصص	45
المجموع		**68**

وصف مخرجات التخصص:

يعد تخصص هندسة البرمجيات التخصص الذي يهتم بتطوير، وتصميم البرمجيات، عالية الجودة آخذة بعين الاعتبار تخصيصات المستخدم، ومتطلباته على جميع المستويات. تهتم هندسة البرمجيات بتكوين البرنامج منذ مراحله الأولى أثناء تحليل المشكلة، ومن ثم التصميم، وكتابة البرنامج حتى القيام بتجريبه، واختباره، وتنصيبه على الأجهزة، والقيام بعملية صيانته.

المجالات المعرفية للمهارات المتخصصة:

الرقم	اسم المجال	الساعات المعتمدة		المواد التعليمية للمجال
		نظري	عملي	
.1	تطوير البرمجيات	18	6	Programming Maths For Computing Database Design & Development Data Structures & Algorithms Application Development Discrete Maths Business Process Support Computing research project
.2	ادارة المشاريع البرمجية	11	4	Professional Practice Planning a Computing Project Software Development lifecycle System Analysis and Design Applied Programming and Design Principles
.3	ادارة الشبكات و تصميمها	4	2	Networking Security Information
	مجموع الساعات المعتمدة	**33**	**12**	**45**

الخطة الدراسية لتخصص " هندسة البرمجيات "

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أولاً: متطلب كلية، (11) ساعات معتمدة موزعة على النحو الآتي:

رقم المادة	اسم المادة	س.م	نظري	عملي	المتطلب السابق
020000111	المواطنة الايجابية ومهارات الحياة	3	3	0	
020000231	ريادة الاعمال	2	2	0	
II SS100	Study Skills	3	3	0	
ICR 100	Career Readiness	3	3	0	
المجموع (س.م)		**11**	**11**	**0**	

ثانياً: المهارات المساندة ، (12) ساعات معتمدة موزعة على النحو الآتي:

رقم المادة	اسم المادة	س.م	نظري	عملي	المتطلب السابق
040022240	التدريب الميداني –هندسة البرمجيات	3	0	9	
040002101	مقدمة في البرمجة باستخدام (Java)	3	2	3	
040002102	مقدمة في تكنولوجيا المعلومات	3	3	0	
040002100	مقدمة في أنظمة التشغيل	3	2	3	
المجموع (س.م)		**12**	7	5	

*** – تدريب عملي متواصل لمدة (8) أسابيع.**

الخطة الدراسية لتخصص " هندسة البرمجيات "

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رابعاً: متطلبات التخصص، (45) ساعة معتمدة، موزعة على النحو الآتي:

رقم المادة	اسم المادة	س.م	نظري	عملي	المتطلب السابق
040011112	Programming	3	2	3	040002101
040011131	Networking	3	2	3	
040011121	Professional Practice	3	3	0	
040011113	Database Design & Development	3	2	3	
040011232	Information Security	3	2	3	040011131
040011122	Planning a Computing Project	3	2	3	
040011111	Maths for computing	3	3	0	
040022121	Software Development lifecycles	3	2	3	
040011216	Computing research project	3	2	3	040011122
040011215	Business Process Support	3	2	3	040011113
040022211	Discrete Maths	3	3	0	040011111
040011214	Data Structure & Algorithms	3	2	3	040011112
040022223	Applied Programming and Design Principles	3	2	3	040011112
040022222	System Analysis and Design	3	2	3	040022121
040022212	Application Development	3	2	3	040011112
	المجموع (س.م)	**45**	**33**	**12**	

الخطة الاسترشادية لتخصص " هندسة البرمجيات "

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الفصل الدراسي الأول			الفصل الدراسي الثاني		
اسم المادة	رقم المادة	س.م.	اسم المادة	رقم المادة	س.م.
مقدمة في تكنولوجيا المعلومات	040002102	3	دورة حياة بناء الأنظمة	040022121	3
مقدمة في البرمجة باستخدام Java	040002101	3	البرمجة	040011112	3
متطلب كلية	ــ	3	تصميم قواعد البيانات و تطويرها	040011113	3
مقدمة في أنظمة التشغيل	040002100	3	ممارسات مهنية و أخلاقية	040011121	3
الرياضيات و الحوسبة	040011111	3	شبكات الحاسوب	040011131	3
متطلب كلية	ــ	3	تخطيط المشاريع المحوسبة	040011122	3
المجموع		**18**	**المجموع**		**18**

الفصل الدراسي الثالث			الفصل الدراسي الرابع		
اسم المادة	رقم المادة	س.م.	اسم المادة	رقم المادة	س.م.
أمن المعلومات	040011232	3	تطوير التطبيقات	040022212	3
أنظمة دعم الأعمال	040011215	3	تحليل وتصميم الأنظمة	040022222	3
تراكيب البيانات و الخوارزميات	040011214	3	متطلب كلية	ــ	3
الرياضيات المنفصلة	040022211	3	التدريب الميداني	040022240	3
البرمجة التطبيقية ومبادئ التصميم	040022223	3	مشاريع الأبحاث الحوسبية	040011216	3
متطلب كلية	ــ	2			
المجموع		**17**	**المجموع**		**15**

الوصف المختصر للمواد التعليمية لتخصص "هندسة البرمجيات "

أولاً: متطلبات الكلية

المواطنة الإيجابية ومهارات الحياة020000111 (3: 3-0)

يوضح المساق مفهوم المواطنة ومهارات الحياة وأهميتهما في اكتساب مهارات قيمه، والعمل على استخدام هذه المهارات في سعيهم للحصول على تعليم افضل ونتائج ايجابيه في العمل، حيث ان المساق يراعي بناء المعرفه في الموضوعات التي يتضمنها البرنامج كما ويبني المهارة عند الشباب لاستخدامها في تطبيق المعرفه كما ويبني الثقه في قدرات الشباب على استخدام هذه المعرفه والمهارة بالاضافه الى توفير الدعم الشخصي والبيئي لتغيير السلوك من خلال تعزيز قيم المواطنة الايجابية والثقافة المجتمعية البناءة والعمل المجتمعي التطوعي

ريادة الأعمال 020000231 (2: 2-0)

يوضح المساق مفهوم ريادة الأعمال، تأثيرها في الإقتصاد الوطني ودورها في القضاء على البطالة، وكيفية استحداث أفكار ريادية ومبتكرة لتوائم احتياجات المجتمع و مواجهة المخاطر والتحديات التي تعترضها، وتقييم فرص نجاحها من خلال دراسة الجدوى، وكيفية حساب كلفتها وتمويلها وإدارة شؤؤونها المالية، وكيفية عمل تسويق لها، والطبيعة القانونية لها وخطة العمل اللازمة للبدء بها مع التركيز على التجربة الأردنية في هذا المجال.

Study Skills II SS10 (3:3-0)

Study Skills is a course provided by Pearson Education. In this course students will practice effective time management, study and organizational skills in addition to other skills that will enhance students' performance throughout college education as well as in their future workplace.

Career Readiness ICR 100 (3:3-0)

This blended learning course provided by Pearson is designed to help students develop the skills and competencies expected by employers in order to increase their competitive employment advantage and achieve their career goals.

The course will help with students' personal development and employment potential through participating in interactive classes and working on an online program provided by Pearson.

By the end of the course students will have produced high quality CVs and learnt the correct way to handle interviews, they will also have developed the skills and competencies expected by employers to increase their employability.

ثانياً: المهارت المساندة

Training –SoftWare Engineering (040022240) (3 :0-9) This track will provide the student with practical working experience related to his field of study. The aim is to provide the student with firsthand knowledge in his domain and allow him to learn directly from experts in the workforce. The real working environment will prepare the student for a successful career launch and sharpen his communication skills and teamwork abilities. Students are required to train for a predefined period, an instructor will follow-up on the progress of the student during the training.
Introduction to Operating Systems (040002100) (3 :2-3) This course provides an introduction to operating systems. It introduces the main concepts of Linux operating systems. The Linux distributions and installations. It also covers the main components of Linux, the philosophy and the terminology. The file system of Linux is introduced and the disk management techniques. The course presents the shell commands and the Linux command line interface (CLI). Finally it introduces the user environment and the permissions. It also introduces the students to the fundamental concepts of networking.
Introduction to programming (Java) (040002101) (3 :2-3) This course introduces students to the basics of problem solving and design using pseudo code and flowcharts. It also gives an introduction to programming using JAVA language, which enables the students to write simple JAVA programs using variables, arithmetic and logical operations, decisions and loops, and functions implementation.
Introduction in Information technology (040002102) (3 :3-0) This track gives the basic concepts of computer and information technology from its two sides (The physical and programmatic sides) and it covers: An introduction in computer components the physical and programmatic components, Counting systems, The ways of data visualization, Stages of programs development, Applied software and systems software. To focus on the fundamentals and ways of problem solving and algorithms design.

ثالثاً: متطلبات التخصص

Programming (040011112)(3:2-3) This unit introduces students to the core concepts of programming along with introduction to algorithms and the characteristics of programming paradigms. Among the topics included in this unit are: introduction to algorithms, procedural, object-orientated & event-driven programming, security considerations, in integrated development environment and the debugging process.
Networking (040011131)(3:2-3) The aim of this unit is to give students wider background knowledge of computer networking essentials, how they operate, protocols, standards, security considerations and the prototypes associated with a range of networking technologies. Students will explore a range of hardware, with related software, and will configure and install these to gain knowledge of networking systems. A range of networking technologies will be explored to deliver a fundamental knowledge of Local Area Networking (LAN), Wide Area Networking (WAN) and their evolution to form large-scale networks.
Professional Practice (040011121)(3:3-0) This unit provides a foundation for good practice in a variety of contexts. The ability to communicate effectively using different tools and mediums will ensure that practical, research, design, reporting and presentation tasks are undertaken professionally and in accordance with various communication conventions. In everyday life the ability to apply critical reasoning and solve problems are necessary skills to enable task resolution and facilitate effective decision-making. Working with others in a group environment academically or within the workplace is an integral part of everyday life. Therefore, understanding the dynamics of teams in terms of culture, roles and responsibilities will ensure that there is a better understanding and awareness of the importance and value of teamwork. Continuing professional development, self-improvement and working towards various goals is an area that is encouraged in the workplace through the appraisals framework. In addition, professional development extends into higher levels of learning and the need to demonstrate effective research skills and academic reporting skills is also required. Among the topics included in this unit are: the development of communication skills and communication literacy; the use of qualitative and quantitative data to

demonstrate analysis, reasoning and critical thinking; and tasks that require the integration of others within a team-based scenario and planning and problem solving.
Database Design & Development.(040011113)(3:2-3) The aim of this unit is to give students opportunities to develop an understanding of the concepts and issues relating to database design and development, as well as to provide the practical skills to translate that understanding into the design and creation of complex databases. Topics included in this unit are: examination of different design tools and techniques; examination of different development software options; considering the development features of a fully functional robust solution covering data integrity, data validation, data consistency, data security and advanced database querying facilities across multiple tables; appropriate user interfaces for databases and for other externally linked systems; creating complex reports/dashboards, testing the system against the user and system requirements; and elements of complete system documentation.
Information Security (040011232)(3:2-3) The aim of this unit is to provide students with knowledge of security, associated risks and how security breaches impact on business continuity. Students will examine security measures involving access authorization, regulation of use, implementing contingency plans and devising security policies and procedures. This unit introduces students to the detection of threats and vulnerabilities in physical and IT security, and how to manage risks relating to organizational security. Among the topics included in this unit are Network Security design and operational topics, including address translation, DMZ, VPN, firewalls, AV and intrusion detection systems. Remote access will be covered, as will the need for frequent vulnerability testing as part of organizational and security audit compliance.
Planning a Computing Project (040011122)(3:2-3) As computing systems and technologies continually develop so do the ways in which businesses utilise technologies to support their operations and remain competitive. As a computing professional it is important to understand the ways in which technology evolves and how it can be utilised in different sectors. The aim of this unit is to give students an opportunity to demonstrate the research skills required for developing a deeper understanding of a subject and the ability to use evidence to inform decisions. Students will undertake independent research, and investigation of a theme

set by Pearson. Students will also investigate and research an industry sector as outlined in the centre-set project brief. Students will use the
outcomes of their research to help them plan a computer-based project and to support recommendations for how the identified business could utilise the tools and technologies identified as part of their research.

Maths For Computing (040011111)(3:3-0)

This unit introduces students to the mathematical principles and theory that underpin the computing curriculum. Through a series of case studies, scenarios and task-based assessments students will explore number theory within a variety of scenarios; use applicable probability theory; apply geometrical and vector methodology; and finally evaluate problems concerning differential and integral calculus. Among the topics included in this unit are: prime number theory, sequences and series, probability theory, geometry, differential calculus and integral calculus.

Software Development lifecycles(040022121)(3:2-3)

This unit introduces students to lifecycle decision-making at different stages of the software development process. Students they will examine various lifecycle models and learn to appreciate their particular characteristics in order to understand for which project environments they are most appropriate. Theoretical understanding will be translated into practical skills through an actual software development lifecycle project. Students will become confident in the use of particular tools and techniques relevant to a chosen methodology. Among the topics included in this unit are iterative and sequential models of software development lifecycles and reference frameworks for initially capturing conceptual data and information through a feasibility study and requirement gathering techniques through to analysis, design and software implementation activities.

Computing Research Project (040011216)(3:2-3)

The aim of this unit is to offer students the opportunity to engage in sustained research in a specific field of study. The unit enables students to demonstrate the capacity and ability to identify a research theme, to develop research aims, objectives and outcomes, and to present the outcomes of such research in both written and verbal formats. The unit also encourages students to reflect on their engagement in the

research process during which recommendations for future, personal development are key learning points.
Business Process Support (040011215)(3:2-3) This unit introduces students to a range of tools, techniques and technologies used for acquiring data and processing it into meaningful information that can be used to support business functions and processes. Students will examine how data and information support business processes, the mechanisms to source and utilise data and turn it in to usable, and valuable, information output. Students will explore real-world business problems, the emergence of data science and how the application of data science can be used to support business processes. Finally, students will demonstrate practical application of data science techniques to support real-world business problems.
Discrete Maths (040022211)(3:3-0) The unit introduces students to the discrete mathematical principles and theory that underpin software engineering. Through a series of case studies, scenarios and tasked-based assessments students will explore set theory and functions in a variety of scenarios; perform analysis using graph theory; apply Boolean algebra to applicable scenarios; and finally explore additional concepts in abstract algebra. Among the topics included in this unit are: set theory and functions, Eulerian and Hamiltonian graphs, binary problems, Boolean equations, Algebraic structures and group theory.
Data Structures & Algorithms(040011214)(3:2-3) This unit introduces students to data structures and how they are used in algorithms, enabling them to design and implement data structures. The unit introduces the specification of abstract data types and explores their use in concrete data structures. Using this knowledge, students should be able to develop solutions by specifying, designing and implementing data structures and algorithms in a variety of programming paradigms for an identified need. Among the topics included in this unit are abstract data types specification, formal data notations, data encapsulation, complex data structures, programming language implementations using handles, pointers, classes and methods, algorithm types, data structure libraries, algorithm complexity, asymptotic testing and benchmarking.

Applied Programming and Design Principles(040022223)(3:2-3)

The aim of this unit is to familiarize students with these concepts and their best practices to ensure that their code is in line with industry standards. Among the topics included in this unit are:
object-orientated programming; introduction to design patterns and SOLID, including its version of five principles of object-oriented programming and automated software testing. The unit is especially useful for those intending to move into computer science, software development, programming, systems analysis and software testing.

System Analysis and Design(040022222)(3:2-3)

Students will explore the processes of systems analysis and design using two methodologies – the traditional systems development lifecycle methodology providing a comprehensive structured framework and the agile methodology with different framework models developed with the emphasis on variations of iterative incremental modelling. To provide perspective, students will examine the models in both these methodologies. They will consider the particular strengths and weaknesses of the two methodologies and examine the suitability of the methodologies using different examples. Topics included in this unit are examining the business case for a new system or for upgrading an existing one, looking at traditional and agile systems analysis methodologies and evaluating the merits of each, considering the implications of moving from using the traditional methods of analysis and design to agile methods on analysts, designers and developers in an organisation, and applying systems design tools and techniques.

Application Development (040022212)(3:2-3)

This unit introduces students to Application Development. It is designed to simulate the roles and responsibilities of a commercial developer working in a suitable business environment with access to a small team of colleagues. Initially, students are introduced to a business-related problem and will need to adopt and use appropriate methods and practices to analyze, break down and discuss the issues – then, decide, design, create and test a possible solution. Students should be free to debate, evaluate and select different design and development methodologies depending on their own judgement and consideration. Among the topics included in this unit are: design and developer documentation; problem analysis; research, system and user requirements; design methodologies and principles; security

considerations; development methodologies; software development lifecycles; teamwork, peer reviews, development tools and techniques; integrated development environments; debugging, testing, software versions and quality assurance.