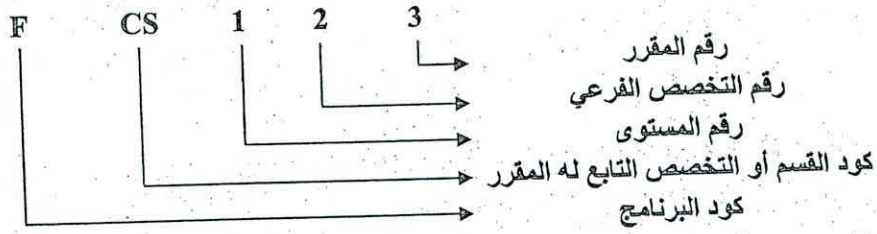


لائحة البرامج الدراسية الجديدة بمصروفات لمرحلة البكالوريوس - كلية الحاسبات والمعلومات - جامعة بنها

قواعد النظام الكودي للمقررات

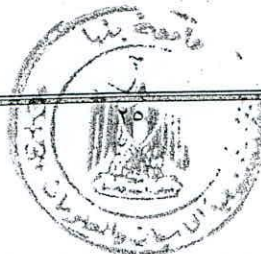
أ- يتكون كود أي مقرر من الرمز الكودي للبرنامج (ف) (F) يليه الرمز الكودي للقسم أو التخصص التابع له المقرر، يلي ذلك عدد مكون من ثلاثة أرقام تفصيلها كالاتي:

- الرقم أقصى اليسار يمثل المستوى الدراسي
- الرقم في خانة العشرات يمثل التخصص الدقيق للمقرر داخل التخصص العام للقسم
- رقم الأحاد يستخدم لتمييز مقررات التخصص الدقيق والتي تدرس لنفس المستوى الدراسي



ب- النظام الكودي للقسم أو التخصص:

م	التخصص أو القسم	الرمز باللغة العربية	الرمز باللغة الإنجليزية	Group / Department
١	علوم الحاسب	فحج	FCS	Computer Science
٢	نظم المعلومات	فم	FIS	Information Systems
٣	الرياضيات والعلوم الأساسية (مثل الإحصاء والفيزياء والإلكترونيات وغيرها)	فص	FBS	Mathematics & Basic Sciences (Such as Statistics - Physics - Electronics ... etc.)
٤	إنسانيات	فنس	FHM	Humanities
	تدريب ميداني	فند	FTR	Field Training
	مشروع	فمش	FPR	Project



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ج- أكواد المستويات الدراسية:

الكود	المستوى
١	الأول
٢	الثاني
٣	الثالث
٤	الرابع

د- أكواد التخصصات الفرعية:

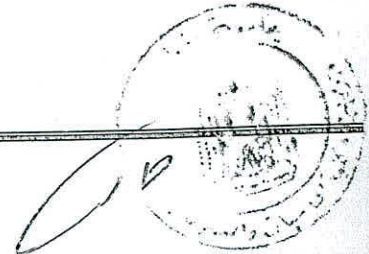
يتم تقسيم تخصصات المقررات إلى التخصصات الفرعية الموضحة بالجدول التالية:

جدول 1. أكواد التخصصات الفرعية لعلوم الحاسب

Code	Sub-Majors	Code	Sub-Majors
0	Discrete Structures Computational Science	1	Algorithms and Complexity
2	Architecture and Organization Operating Systems	3	Networking
4	Programming Languages	5	Graphics and Visual Computing
6	Intelligent Systems	7	Computer Security
8	Digital Forensics	9	Software Engineering

جدول 2. أكواد التخصصات الفرعية لتنظيم المعلومات

Code	Sub-Majors	Code	Sub-Majors
0	Foundations of Information Systems	1	Data and Information Management
2	IS Project Management	3	Systems Analysis and Design
	Information Management and Acquisition	5	Information Systems Security



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جدول 3. أكواد تخصصات الرياضيات والعلوم الأساسية

Code	Sub-Majors	Code	Sub-Majors
0	Mathematics	1	Statistics
2	Physics	3	Electronics
4	General Subjects		

جدول 4. أكواد تخصصات العلوم الإنسانية

Code	Sub-Majors	Code	Sub-Majors
0	Basic Sciences	1	Languages
2	Social Sciences	3	Business, Management and Economics
4	Legal and Law	5	General Subjects

المقررات الدراسية

يشترط للحصول على درجة البكالوريوس في الحاسبات والمعلومات تخصص "أمن المعلومات واكتشاف الأدلة الجنائية الرقمية" دراسة ١٤١ ساعة معتمدة موزعة على النحو التالي:

أ- المتطلبات العامة (١٢) ساعة معتمدة:

• (٤) ساعات إجبارية

• (٨) ساعات يختارها الطالب من بين المقررات الاختيارية

ب- متطلبات الكلية (٦٣) ساعة معتمدة:

تنقسم إلى قسمين

• الرياضيات والعلوم الأساسية (الإحصاء والفيزياء والإلكترونيات) (٢٤) ساعة معتمدة

ج- متطلبات التخصص (١٦) ساعة معتمدة:

تنقسم إلى ثلاثة أقسام

• علوم تطبيقية (٥٧) ساعة معتمدة



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▪ (٤٢) ساعة إجبارية

▪ (١٥) ساعة يختارها الطالب من بين المقررات الاختيارية

• مشروع (٥) ساعات معتمدة إجبارية

• تدريب (٤) ساعة معتمدة إجبارية

وتشمل مقررات اللائحة التالية على القوائم الدراسية المختلفة في البرنامج موضحاً عدد الساعات المعتمدة لكل مقرر، وما يناظرها من الساعات الفعلية للتدريس وما يدعمها من المعامل والتمارين، مع توضيح نوعية المقرر كما هو موضح بالجدول التالي:

الرمز	نوعية المقرر	عدد ساعات تلك النوعية في البرنامج	نسبة ساعات تلك النوعية في البرنامج	NARS 2010
أ	مقررات إنسانية واجتماعية (متطلبات جامعة)	١٢	%٨,٥١	(١٠-٨) %
ب	رياضيات وعلوم أساسية	٢٤	%١٧,٠٢	(١٨-١٦) %
ج	علوم حاسب أساسية (متطلبات كلية)	٣٩	%٢٧,٩٩	(٢٨-٢٦) %
د	علوم تطبيقية (متطلبات التخصص)	٤٢	%٢٩,٧٩	(٣٠-٢٨) %
هـ	تدريب ميداني	٤	%٢,٨٣	(٥-٣) %
و	مشروع	٥	%٣,٥٤	(٥-٣) %
ز	اختياري (موضوعات تحددها المؤسسة)	١٥	%١٠,٦٤	(١٦-٤) %
	المجموع	١٤١	%١٠٠	



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أولاً: المتطلبات العامة (١٢) ساعة معتمدة

أ- المقررات الإلزامية:

• (٤) ساعات إجبارية مقسمة كالتالي:

المتطلب السابق	نوع المقرر	عدد الساعات الفعلية			عدد الساعات المعتمدة	اسم المقرر	كود المقرر
		معمل	تدريبات	محاضرة			
-	١	-	-	٢	٢	لغة إنجليزية ١ English 1	فنس ١١١ FHM111
-	١	-	-	٢	٢	البحث الجنائي Criminal Investigation	فنس ١٤١ FHM141

ب- المقررات الاختيارية:

• (٨) ساعات يختارها الطالب من بين المقررات الاختيارية التالية:

المتطلب السابق	نوع المقرر	عدد الساعات الفعلية			عدد الساعات المعتمدة	اسم المقرر	كود المقرر
		معمل	تدريبات	محاضرة			
-	١	-	-	٢	٢	علم الجريمة Criminology	فنس ١٤٢ FHM142
-	١	-	-	٢	٢	الكتابة التقنية Technical Writing	فنس ١١٢ FHM112
-	١	-	-	٢	٢	حقوق الإنسان Human Rights	فنس ١٢١ FHM121
-	١	-	-	٢	٢	تاريخ الحوسبة History of Computing	فنس ١٥١ FHM151
-	١	-	-	٢	٢	تسويق - مبيعات Marketing & Sales	فنس ١٣٣ FHM131
-	١	-	-	٢	٢	السلوك التنظيمي Organizational Behavior	فنس ١٢٢ FHM122
-	١	-	-	٢	٢	مقدمة في القانون الجنائي Introduction to Criminal Justice	فنس ١٤٣ FHM243
-	١	-	-	٢	٢	علم النفس الجنائي Criminal Psychology	فنس ٢٢٣ FHM223



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المتطلب السابق	نوع المقرر	عدد الساعات الفعلية			عدد الساعات المعتمدة	اسم المقرر	كود المقرر
		معمل	تدريبات	محاضرة			
-	أ	-	-	٢	٢	مهارات العرض والاتصال Communication & Presentation Skills	فئس ٢١٣ FHM213
-	أ	-	-	٢	٢	أخلاقيات المهنة Professional Ethics	فئس ٢٤٤ FHM244
فئس ١١١ FHM111	أ	-	-	٢	٢	لغة إنجليزية ٢ English 2	فئس ٢١٤ FHM214
-	أ	-	-	٢	٢	إدارة الأعمال Business Administration	فئس ٢٢٢ FHM232
-	أ	-	-	٢	٢	مبادئ الاقتصاد Fundamentals of Economics	فئس ٢٣٣ FHM233
-	أ	-	-	٢	٢	موضوعات مختارة في الانسانيات Selected Topics in Humanities	فئس ٢٥٢ FHM252

ملحوظة:

مقرر "موضوعات مختارة في الانسانيات" يتم تحديد المحتوى العلمي وكذلك المتطلب السابق من خلال مجلس إدارة البرنامج ومجلس الكلية.

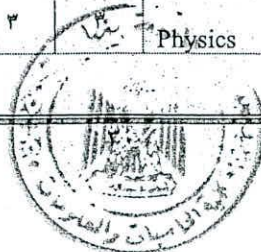
ثانيا: متطلبات الكلية (٦٣) ساعة معتمدة

تنقسم إلى قسمين:

أ- علوم أساسية (الرياضيات والإحصاء والفيزياء والإلكترونيات):

• (٢٤) ساعة معتمدة إجبارية مقسمة كالتالي:

المتطلب السابق	نوع المقرر	عدد الساعات الفعلية			عدد الساعات المعتمدة	اسم المقرر	كود المقرر
		معمل	تدريبات	محاضرة			
-	أ	-	٤	٣	٣	حساب التفاضل والتكامل Calculus	فئس ١٠١ FBS101
-	أ	٢	٢	٣	٣	فيزياء Physics	فئس ١٢١ FBS121



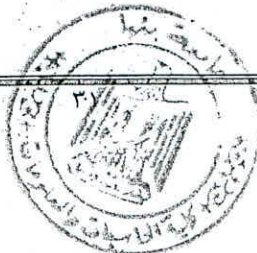
لائحة البرامج الدراسية الجديدة بمصروفات لمرحلة البكالوريوس - كلية الحاسبات والمعلومات - جامعة بنها

المتطلب السابق	نوع المقرر	عدد الساعات الفعلية			عدد الساعات المعتمدة	اسم المقرر	كود المقرر
		معمل	تمارين	محاضرة			
-	ب	-	٤	٢	٣	احتمالات وإحصاء Probability & Statistics	فبس ١١١ FBS111
-	ب	-	٤	٢	٣	الرياضيات المنفصلة Discrete Mathematics	فبس ١٠٢ FBS102
-	ب	٢	٢	٢	٣	إلكترونيات Electronics	فبس ١٣١ FBS131
فبس ١١١ FBS111	ب	-	٤	٣	٣	تحليل إحصائي Statistical Analysis	فبس ٢١٢ FBS212
-	ب	-	٤	٣	٣	جبر خطي Linear Algebra	فبس ٢٠٣ FBS203
فبس ١٠١ FBS101	ب	-	٤	٣	٣	معادلات تفاضلية Differential Equations	فبس ٢٠٤ FBS204

ب- علوم حاسب أساسية:

• (٣٩) ساعة معتمدة إجبارية مقسمة كالتالي:

المتطلب السابق	نوع المقرر	عدد الساعات الفعلية			عدد الساعات المعتمدة	اسم المقرر	كود المقرر
		معمل	تمارين	محاضرة			
-	ج	٣	-	٣	٣	أساسيات علوم الحاسب Computer Science Fundamentals	فبس ١٠١ FCS101
-	ج	٣	-	٣	٣	برمجة هيكلية Structured Programming	فبس ١٤١ FCS141
فبس ١٤١ FCS141	ج	٣	-	٣	٣	برمجة شبيهة Object Oriented Programming	فبس ١٤٢ FCS142
فبس ١٤١ FCS141	ج	٣	-	٣	٣	هياكل البيانات Data Structures	فبس ٢١١ FCS211
فبس ١٣١ FBS131	ج	٣	-	٣	٣	التصميم المنطقي Logic Design	فبس ٢٢١ FCS221
فبس ١٠١ FCS101	ج	٢	-	٧	٣	تقديم نظم المعلومات Introduction to Information Systems	فبس ٢٠١ FIS201
فبس ١٠١ FCS101	ج	٢	-	٣	٣	تحليل وتصميم النظم Systems Analysis and Design	فبس ٢٣١ FIS231



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المتطلب السابق	نوع المقرر	عدد الساعات الفعلية			عدد الساعات المعتمدة	اسم المقرر	كود المقرر
		معمل	تدريبات	محاضرة			
فجع ٢٢١ FCS221	ج	٢	-	٢	٣	بناء الحاسب Computer Architecture	فجع ٢٢٢ FCS222
فجع ١٠١ FCS101	ج	٢	-	٢	٣	نظم التشغيل Operating Systems	فجع ٢٢٣ FCS223
فجع ١٠١ FCS101	ج	٢	-	٢	٣	مقدمة في شبكات الحاسب Introduction to Computer Networks	فجع ٢٣١ FCS231
فجع ٢١١ FCS211	ج	٢	-	٢	٣	تنظيم الملفات File Organization	فجع ٣١٢ FCS312
فجع ٢١١ FCS211	ج	٢	-	٢	٣	تصميم وتحليل الخوارزميات Design and Analysis of Algorithms	فجع ٣١٣ FCS313
-	ج	٢	-	٢	٣	برمجة الويب Web Programming	فجع ٣٤٣ FCS343

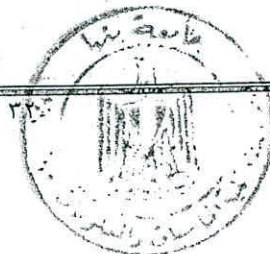
ثالثاً: متطلبات التخصص (٦٦) ساعة معتمدة

تنقسم إلى ثلاثة أقسام:

أ- علوم تطبيقية (٥٧) ساعة معتمدة:

• (٤٢) ساعة معتمدة إجبارية مقسمة كالتالي:

المتطلب السابق	نوع المقرر	عدد الساعات الفعلية			عدد الساعات المعتمدة	اسم المقرر	كود المقرر
		معمل	تدريبات	محاضرة			
فجع ٢٣١ FIS231	د	٢	-	٢	٣	قواعد البيانات Databases	فجع ٣١١ FIS311
-	د	٢	-	٢	٣	الذكاء الاصطناعي Artificial Intelligence	فجع ٣٦١ FCS361
فجع ٢٣١ FCS231	د	٢	-	٢	٣	شبكات الحاسب المتقدمة Advanced Computer Networks	فجع ٣٣٢ FCS332
-	د	٢	-	٢	٣	مقدمة في الأدلة الجنائية الرقمية Introduction to Digital Forensics	فجع ٣٨١ FCS381
فجع ٣١٣ FCS313	د	٢	-	٢	٣	هندسة البرمجيات Software Engineering	فجع ٣٩١ FCS391

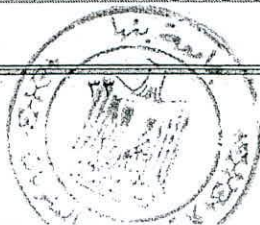


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المتطلب السابق	نوع المقرر	عدد الساعات الفعلية			عدد الساعات المعتمدة	اسم المقرر	كود المقرر
		معمل	تدريبات	محاضرة			
فحص ٢٠٣ FBS203	د	٢	٢	٣	٣	الرسم بالحاسب Computer Graphics	فحص ٣٥١ FCS351
فحص ١٤١ FCS141	د	٢	-	٣	٣	تطوير تطبيقات الهاتف المحمول Mobile Applications Development	فحص ٣٤٤ FCS344
فحص ٣١٣ FCS313	د	٢	-	٣	٣	علم التشفير Cryptography	فحص ٣٧١ FCS371
فحص ٣١٣ FCS313	د	٢	-	٣	٣	معالجة الصور Image Processing	فحص ٤٥٢ FCS452
فحص ١٤٢ FCS142	د	٢	-	٣	٣	تطوير البرمجيات مفتوحة المصدر Open Source Software Development	فحص ٤٤٥ FIS445
فحص ٣٣٢ FCS332	د	٢	-	٣	٣	أمن الشبكات Network Security	فحص ٤٧٢ FCS472
فحص ٣٣٢ FCS332	د	٣	-	٣	٣	الحوسبة السحابية Cloud Computing	فحص ٤٣٣ FCS433
فحص ٤٥٢ FCS452	د	٣	-	٣	٣	اكتشاف الأدلة الجنائية في الصور Image Forensics	فحص ٤٨٢ FCS482
فحص ٣٧١ FCS371	د	٣	-	٣	٣	البرمجة الآمنة Secure Programming	فحص ٤٧٣ FCS473

٥ (١٥) ساعة يختارها الطالب من بين المقررات الاختيارية التالية:

المتطلب السابق	نوع المقرر	عدد الساعات الفعلية			عدد الساعات المعتمدة	اسم المقرر	كود المقرر
		معمل	تدريبات	محاضرة			
-	د	٣	-	٣	٣	أمن الحاسب Computer Security	فحص ٣٧٤ FIS374
فحص ٣٨١ FCS381	د	-	-	٣	٣	اكتشاف الأدلة الجنائية الرقمية في نظام الملفات System Forensics	فحص ٣٨٣ FCS383
FCS223	د	-	-	٣	٣	نظام التشغيل Operating System Forensics	فحص ٣٨٤ FCS384
فحص ٣٧١ FCS371	د	٣	-	٣	٣	الأمن السيبراني Cyber Security	فحص ٤٧٥ FCS475
فحص ٣٧١ FCS371	د	٢	-	٣	٣	إخفاء المعلومات Steganography	فحص ٤٧٦ FCS476



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المتطلب السابق	نوع المقرر	عدد الساعات الفئوية			عدد الساعات المعتمدة	اسم المقرر	كود المقرر
		معمل	تدريبات	محاضرة			
-	ز	٣	-	٣	٣	الاختراق الأخلاقي Ethical Hacking	فمح ٤٧٧ FCS477
-	ز	٣	-	٣	٣	موضوعات مختارة في أمن المعلومات Selected Topics in Information Security	فمح ٤٧٨ FCS478
فمح ٣٨١ FCS381	ز	٣	-	٣	٣	اكتشاف الأدلة الجنائية الرقمية في الأجهزة المحمولة Mobile Device Forensics	فمح ٤٨٥ FCS485
-	ز	٣	-	٣	٣	موضوعات مختارة في اكتشاف الأدلة الجنائية الرقمية Selected Topics in Digital Forensics	فمح ٤٨٦ FCS486

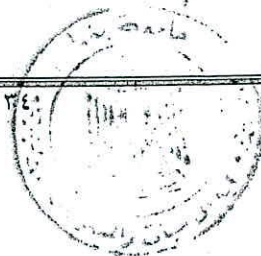
ملحوظة:

مقرري "موضوعات مختارة في أمن المعلومات" و "موضوعات مختارة في اكتشاف الأدلة الجنائية الرقمية" يتم تحديد المحتوى العلمي وكذلك المتطلب السابق لكل منهما من خلال مجلس إدارة البرنامج ومجلس الكلية.

ب- مشروع (٥) ساعات معتمدة إجبارية:

المتطلب السابق	نوع المقرر	عدد الساعات الفئوية			عدد الساعات المعتمدة	اسم المقرر	كود المقرر
		معمل	تدريبات	محاضرة			
-	و	٥	-	٥	٢	مشروع التخرج ١ Capstone Project I	فمش ٤٠١ FPR401
فمش ٤٠١	و	٥	-	٥	٢	مشروع التخرج ٢ Capstone Project II	فمش ٤٠٢ FPR402

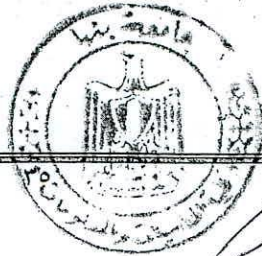
ج- تدريب (٤) ساعة معتمدة إجبارية:



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(٤) ساعة إجبارية يتحتم فيها على الطالب حضور "تدريب ميداني" - "Field Training" قبل التخرج (ساعتين بعد المستوى الثاني وساعتين بعد المستوى الثالث)، ويتم تخصيص عضو هيئة تدريس مع عدد من أعضاء الهيئة المعاونة للإشراف ومتابعة التدريب وتقييمه طبقا لمعايير يتم تحديدها من قبل مجلس إدارة البرنامج ومجلس الكلية

كود التدريب: فتر ٤٠٠ FTR400

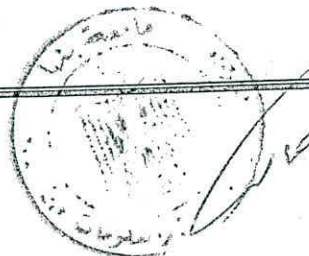


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نموذج مقترح لخطة دراسية

المستوى الأول					
الفصل الدراسي الثاني			الفصل الدراسي الأول		
عدد الساعات	اسم المقرر	كود المقرر	عدد الساعات	اسم المقرر	كود المقرر
٣	برمجة شيئية Object Oriented Programming	فجع ١٤٢ FCS142	٣	أساسيات علوم الحاسب Computer Science Fundamentals	فجع ١٠١ FCS101
٣	احتمالات وإحصاء Probability & Statistics	ففس ١١١ FBS111	٣	برمجة هيكلية Structured Programming	فجع ١٤١ FCS141
٣	الرياضيات المنفصلة Discrete Mathematics	ففس ١٠٢ FBS102	٣	حساب التفاضل والتكامل Calculus	ففس ١٠١ FBS101
٣	إلكترونيات Electronics	ففس ١٣١ FBS131	٣	فيزياء Physics	ففس ١٢١ FBS121
٢	البحث الجنائي Criminal Investigation	ففس ١٤٦ FHM141	٢	لغة إنجليزية ١ English 1	ففس ١١١ FHM111
٢	مقرر إنسانيات ٢ (اختياري) Humanities 2	ففس ١XX FHM1XX	٢	مقرر إنسانيات ١ (اختياري) Humanities 1	ففس ١XX FHM1XX
١٦	إجمالي عدد الساعات		١٦	إجمالي عدد الساعات	

المستوى الثاني					
الفصل الدراسي الرابع			الفصل الدراسي الثالث		
عدد الساعات	اسم المقرر	كود المقرر	عدد الساعات	اسم المقرر	كود المقرر
٣	تحليل وتصميم النظم Systems Analysis and Design	ففس ٢٢١ FIS231	٣	هياكل البيانات Data Structures	فجع ٢١١ FCS211
٣	معادلات تفاضلية Differential Equations	ففس ٢٠٤ FBS204	٣	تحليل إحصائي Statistical Analysis	ففس ٢١٢ FBS212
٣	بناء الحاسب Computer Architecture	فجع ٢٢٢ FCS222	٣	جبر خطي Linear Algebra	ففس ٢٠٣ FBS203
٣	نظم التشغيل Operating Systems	فجع ٢٢٣ FCS223	٣	التصميم المنطقي Logic Design	فجع ٢٢١ FCS221
٣	مقدمة في شبكات الحاسب Introduction to Computer Networks	فجع ٢٣١ FCS231	٣	مقدمة في البرمجة Introduction to Programming	ففس ٢٠١ FBS201
٦	مقرر إنسانيات ٤ (اختياري) Humanities 4	ففس ٢XX FHM2XX	٦	مقرر إنسانيات ٣ (اختياري) Humanities 3	ففس ٢XX FHM2XX
١٧	إجمالي عدد الساعات		١٧	إجمالي عدد الساعات	

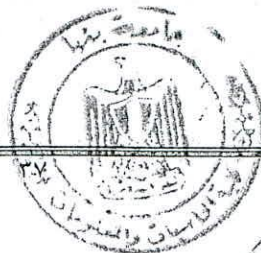


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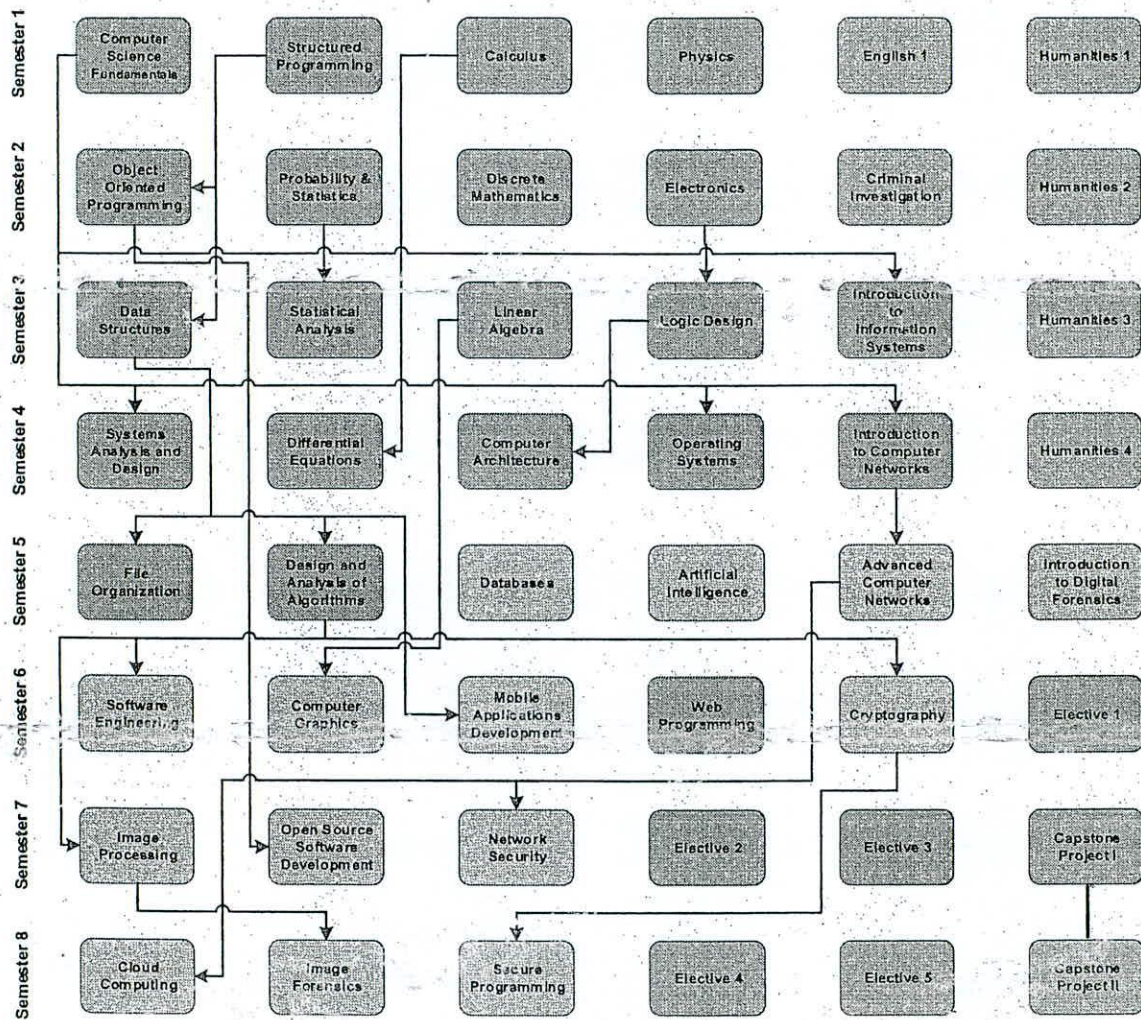
المستوى الثالث					
الفصل الدراسي السادس			الفصل الدراسي الخامس		
عدد الساعات	اسم المقرر	كود المقرر	عدد الساعات	اسم المقرر	كود المقرر
٣	هندسة البرمجيات Software Engineering	فصح ٣٩١ FCS391	٣	تنظيم الملفات File Organization	فصح ٣١٢ FCS312
٣	الرسم بالحاسب Computer Graphics	فصح ٣٥١ FCS351	٣	تصميم وتحليل الخوارزميات Design and Analysis of Algorithms	فصح ٣١٣ FCS313
٣	تطوير تطبيقات الهاتف المحمول Mobile Applications Development	فصح ٣٤٤ FCS344	٣	قواعد البيانات Databases	فصح ٣١١ FIS311
٣	برمجة الويب Web Programming	فصح ٣٤٣ FCS343	٣	الذكاء الاصطناعي Artificial Intelligence	فصح ٣٦١ FCS361
٣	علم التشفير Cryptography	فصح ٣٧١ FCS371	٣	شبكات الحاسب المتقدمة Advanced Computer Networks	فصح ٣٣٢ FCS332
٣	مقرر اختياري ١ Elective 1	فصح ٣XX FCS3XX	٣	مقدمة في الأدلة الجنائية الرقمية Introduction to Digital Forensics	فصح ٣٨١ FCS381
١٨	إجمالي عدد الساعات		١٨	إجمالي عدد الساعات	

المستوى الرابع					
الفصل الدراسي الثامن			الفصل الدراسي السابع		
عدد الساعات	اسم المقرر	كود المقرر	عدد الساعات	اسم المقرر	كود المقرر
٣	الحوسبة السحابية Cloud Computing	فصح ٤٣٣ FCS433	٣	معالجة الصور Image Processing	فصح ٤٥١ FCS452
٣	اكتشاف الأدلة الجنائية في الصور Image Forensics	فصح ٤٨٢ FCS482	٣	تطوير البرمجيات مفتوحة المصدر Open Source Software Development	فصح ٤٤٥ FIS445
٣	البرمجة الآمنة Secure Programming	فصح ٤٧٣ FCS473	٣	أمن الشبكات Network Security	فصح ٤٧٢ FCS472
٣	مقرر اختياري ٤ Elective 4	فصح ٤XX FCS4XX	٣	مقرر اختياري ٢ Elective 2	فصح ٤XX FCS4XX
٣	مقرر اختياري ٥ Elective 5	فصح ٤XX FCS4XX	٣	مقرر اختياري ٣ Elective 3	فصح ٤XX FCS4XX
٣	مشروع التخرج ٢ Capstone Project II	فصح ٤٠٢ FPR402	٣	مشروع التخرج ١ Capstone Project I	فصح ٤٠١ FPR401
١٨	إجمالي عدد الساعات		١٨	إجمالي عدد الساعات	

بالإضافة إلى تدريب صيفي (٦) ساعة معتمدة



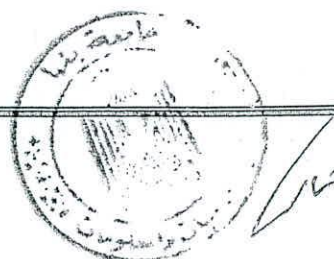
خريطة التدفق لمقررات البرنامج



Humanities, ethical, and Social Sciences (University Requirement)

Basic Computer Science (Institutional Requirement)

Projects



محتوى المقررات

أولاً: المتطلبات العامة (١٢) ساعة معتمدة

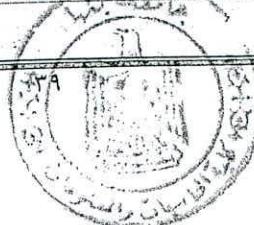
أ- المقررات الإلزامية:

FHM111	English 1	لغة إنجليزية ١	فئس ١١١
Prerequisites:	-		
Course Content:	The course aims at developing proficiency in speaking, listening, reading, and writing of English. It is generalized as a remedial course for students whose English need considerable repair. The contents include parts of speech, count and uncountable nouns and articles, agreement between subject and verb, adverbs of frequency, tense and the sequence of tenses, active and passive voices, types of sentences, prepositions: time, place, action, directions, questions forms, multi-word verbs, capitalization.		

FHM141	Criminal Investigation	البحث الجنائي	فئس ١٤١
Prerequisites:	-		
Course Content:	This course introduces students to the fundamentals of criminal investigations, rules of evidence, sources of information, observations, descriptions, and identifications. The major areas of focus include collection techniques, preservation techniques, technological aids in investigating, and the processing of physical evidence; records reports, crime scene processing, including some post-crime scene processing of evidence; follow-up investigation and recent techniques of enhancing the criminal investigation function. Also provides an opportunity for in depth examination of the investigation needs of certain crimes.		

ب- المقررات الاختيارية:

FHM142	Criminology	علم الجريمة	فئس ١٤٢
Prerequisites:	-		
Course Content:	This course introduces an examination of the field of criminology, including theories, basic assumptions, and definitions. It allows students to study the theories of crime and criminality alongside contemporary forensic techniques and practice. They will explore ways in which they may combine methods of crime detection, classification and prevention with classical criminological ideas.		



محتوى المقررات

أولاً: المتطلبات العامة (١٢) ساعة معتمدة

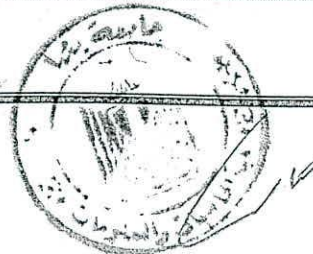
أ- المقررات الإلزامية:

FHM ١١١	English ١	لغة إنجليزية ١	فئس ١١١
Prerequisites:	-		
Course Content:	The course aims at developing proficiency in speaking, listening, reading, and writing of English. It is generalized as a remedial course for students whose English need considerable repair. The contents include parts of speech, count and uncountable nouns and articles, agreement between subject and verb, adverbs of frequency, tense and the sequence of tenses, active and passive voices, types of sentences, prepositions. time, piace, action, directions, questions forms, multi-word verbs, capitalization.		

FHM ١٤١	Criminal Investigation	البحث الجنائي	فئس ١٤١
Prerequisites:	-		
Course Content:	This course introduces students to the fundamentals of criminal investigations, rules of evidence, sources of information, observations, descriptions, and identifications. The major areas of focus include collection techniques, preservation techniques, technological aids in investigating, and the processing of physical evidence, records, reports, crime scene processing, including some post-crime scene processing of evidence; follow-up investigation and recent techniques of enhancing the criminal investigation function. Also provides an opportunity for in depth examination of the investigation needs of certain crimes.		

ب- المقررات الاختيارية:

FHM ١٤٢	Criminology	علم الجريمة	فئس ١٤٢
Prerequisite:	-		
Course Content:	This course introduces an examination of the field of criminology, including the theories, basic assumptions, and definitions. It allows students to study the theories of crime and criminality alongside contemporary forensic techniques and practice. They will explore ways in which they may combine methods of crime detection, classification and prevention with classical criminological ideas.		



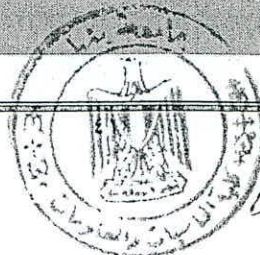
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FHM131	Marketing & Sales	تسويق ومبيعات	فئس ١٣١
Prerequisites:	-		
Course Content:	<p>The course defines marketing; marketing process; market analysis: customer base; competition; best practices and lessons learned; business research and forecasting tools and techniques; trend analysis: economics; social; political; environmental; technology; technology assessment practices and techniques; presentation skills; sales and advertising practices; customer satisfaction strategies; marketing and branding techniques; product portfolio analysis; global trade and international operations; pricing strategies. managing marketing through: customer relationships; social responsibility; marketing ethics. It emphasizes e-commerce application and implementation through business models and technology essentials.</p>		

FHM122	Organizational Behavior	السلوك التنظيمي	فئس ١٢٢
Prerequisites:	-		
Course Content:	<p>Perception, learning, motivation and value; individual differences and work performance; understanding yourself; motivating yourself and others, working within groups, achieving success through goal setting, achieving high personal productivity and quality; achieving rewarding and satisfying career; communicating with people; leading and influencing others; building relationships with supervisors, co-workers and customers</p>		

FHM243	Introduction to Criminal Justice	مقدمة في القانون الجنائي	فئس ٢٤٣
Prerequisites:	-		
Course Content:	<p>This course provides an overview of the Egyptian criminal justice system; Agencies and processes involved in law enforcement and courts as well as correctional approaches will be introduced. It is designed to provide students with knowledge of terminology, classification systems and theories of criminal justice.</p>		

FHM223	Criminal Psychology	علم النفس الجنائي	فئس ٢٢٣
Prerequisites:	-		



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Course Content:	Through this course, students are introduced to personality theories and learning styles in the context of criminal and violent behavior theories. Discussions focus on historical and modern theories of criminal behavior, including behavioral, cognitive, developmental and biological doctrines. A study of criminal behavior from a psychological perspective with correctional rehabilitation programs and strategies serving as the focus. The effectiveness of various correctional institutions and their programs and strategies will also be examined.
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FHM213	Communication & Presentation Skills	مهارات العرض والاتصال	فئس ٢١٣
Prerequisites:	-		
Course Content:	Topics include: theories of communication – how to translate theories into complete strategies to communicate with diverse audience – written communications: memoranda, letters, executive summaries, business and research reports – oral communications: listening, presentation skills, interviewing, conducting meetings, interpersonal communication – negotiation – intercultural communication – importance of communication in team building.		

FHM244	Professional Ethics	أخلاقيات المهنة	فئس ٢٤٤
Prerequisites:	-		
Course Content:	This course will first cover some types of ethical theory and codes of ethics for computer professionals. It will then discuss such topics as the responsibility and liability of software creators and software vendors, computers and privacy, computers and the distribution of power in our society, and ownership of software. Topics covered include: the need for computer ethics training and historical milestones, defining the field of computer ethics, developing the ethical analysis skills and professional values, computer ethics codes, and sample topics in computer ethics.		

FHM214	English 2	الإنجليزية ٢	فئس [إنجليزية ٢]
Prerequisites:	FHM111 [English 1]		
Course Content:	A course to provide a solid foundation on perfecting skills in English reading, writing, listening comprehension and speaking. The course emphasizes the practice of pronunciation, speed-reading, and effective writing and listening. The course contents		

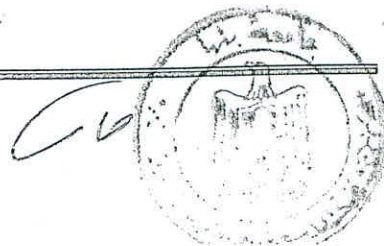
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	include the grammar parts of revision of tenses, use of idioms, prepositions, modals, conditional sentence, use of linking words, use of suffixes and prefixes, synonyms and antonyms, words with multi names, reading parts include the skills in skimming, scanning, selecting information, writing parts include planning, outlining, organizing ideas, topic sentences, paragraph writing, essay writing, job applications, writing reports, writing research report.
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FHM214	Business Administration	فئس ٢٣٢	إدارة الأعمال
Prerequisites:			
Course Content:	Topics covered include: management concepts, level and types of management, planning and organization of work flow, delegation, leadership styles, decision making, stress and time management, and employee relations, decision-making in such areas as investment in operations, productions planning, scheduling and control, reliability and maintenance.		

FHM233	Fundamentals of Economics	فئس ٢٣٣	مبادئ الاقتصاد
Prerequisites:			
Course Content:	The course presents definition of economics, economics and engineering, principles of economics. Topics include: Introduction to various economic systems – capitalist, command and mixed economy; Fundamental economic problems and the mechanism through which these problems are solved; Theory of demand and supply and their elasticities; Theory of consumer behavior; Cardinal and ordinal approaches of utility analysis; Price determination; Nature of an economic theory; Applicability of economic theories to the problems of developing countries; Indifference curve techniques; Theory of production, production function, types of productivity; Rational region of production of an engineering firm; Concepts of market and market structure; Cost analysis and cost function; Small scale production and large scale production; Optimization; Theory of distribution: Use of derivative in economics: maximization and minimization of economic functions, relationship among total, marginal and average concepts.		

FHM252	Selected Topics in Humanities	فئس ٢٥١	موضوعات مختارة في الإنسانيات
Prerequisites:	Varies with the topics		



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Course Content:	Topics are selected from different areas in Humanities that are not covered in the description of the courses listed in the curriculum. This course will cover recent trends and issues in the field of Humanities and will be chosen at the discretion of the Program Administration Council and the Faculty Council.
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ثانيا: متطلبات الكلية (٦٣) ساعة معتمدة

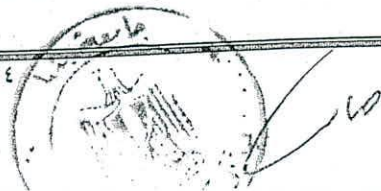
تنقسم إلى قسمين:

١- علوم أساسية (الرياضيات والإحصاء والفيزياء والإلكترونيات):

FBS101	Calculus	فحص ١٠١ حساب التفاضل والتكامل
Prerequisites:	-	
Course Content:	This course covers pre-calculus review: sets and functions; limits and continuity – derivatives: techniques of differentiation; derivatives of the basic and fundamental functions; implicit differentiation; linear approximation and differentials; extreme of functions; optimization problems; velocity and acceleration – integrals: indefinite integrals; change of variables; definite integrals; the fundamental theorem of calculus – techniques of integration: integration by parts; trigonometric integrals and substitutions; integrals of rational functions – numerical integration – applications of definite integrals.	

FBS121	Physics	فحص ١٢١ فيزياء
Prerequisites:	-	
Course Content:	This course covers vector analysis; coulombs law and electric field intensity, electric flux density, gauss law and divergence; energy and potential; conductors, dielectrics, and capacitance; experimental mapping methods; Poisson and Laplace equations; steady magnetic field, magnetic forces, materials, and inductance; time varying Maxwell's equations; and uniform plane waves.	

FBS111	Probability & Statistics	فحص ١١١ احتمالات وإحصاء
Prerequisites:	-	

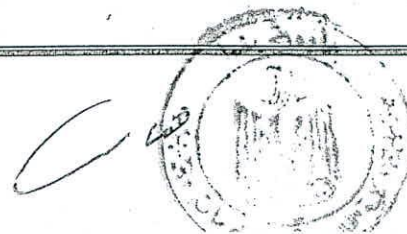


Course Content:	Topics covered include: frequency distribution; mean, median, mode and other measures of central tendency. Standard deviation and other measures of dispersion. Moments, skewness and kurtosis, correlation and regression analysis. Elementary probability theory and discontinuous probability distribution, e.g., binomial, Poisson and negative binomial. Continuous probability distributions, e.g. normal and exponential. Characteristics of distributions. Elementary sampling theory. Estimation of parameter, Hypothesis testing, Index number. Time series analysis and Markov chain.
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FBS102	Discrete Mathematics	الرياضيات المنفصلة	فيس ٢
Prerequisites:	-		
Course Content:	This course provides students a solid background on discrete mathematics and structures pertinent to computer science. Topics include logic; set theory; mathematical reasoning; counting techniques; discrete probability; trees, graphs, and related algorithms; modeling computation. Subjects may include proof by induction, introduction to graph theory, recurrences, sets, functions, and an introduction to program correctness.		

FBS131	Electronics	الالكترونيات	فيس ١
Prerequisites:	-		
Course Content:	This course teaches classical switching theory including Boolean algebra, logic minimization, algorithmic state machine abstractions, and synchronous system design. This theory is then applied to digital electronic design. Techniques of logic implementation, from Small Scale Integration (SSI) through Application-Specific Integrated Circuits (ASICs), are encountered. Topics covered may include: electrical circuit laws and theorems: Ohm's Kirchhoff's, mesh, nodal, Thevenin's maximum power transfer theorems for both DC and AC circuits, R, L, C elements. Electronic components and circuits diodes - bipolar junction transistors - field-effect transistors and use of transistors in amplifiers. OP-Amp, digital circuits - flip-flops, multiplexers, decoders, shift registers and memory circuits.		

FBS212	Statistical Analysis	تحليل احصائي	فيس ٢
Prerequisites:	FBS111 [Probability & Statistics]		فيس ١ [احتمالات واحصاء]



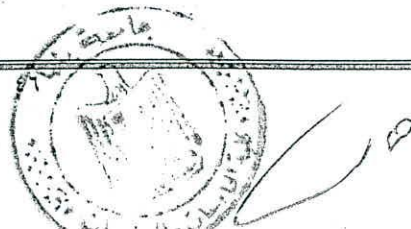
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Course Content:	This course prepares students to carry out descriptive and inferential statistical analyses. It covers statistical skills for advanced work in the functional areas of data science and analytics, including descriptive statistics, probability and its distributions, sampling, and estimation.
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FBS203	Linear Algebra	جبر خطي	فحص ٢٠٢
Prerequisites:	-		
Course Content:	This course covers matrix theory and linear algebra. Topics covered include systems of linear equations, matrix algebra, vector spaces, linear independence, dimension, linear transformations, eigenvectors and eigenvalues, inner products and orthogonality and projections, and their applications.		

FBS204	Differential Equations	معادلات تفاضلية	فحص ٢٠٤
Prerequisites:	فحص (١٠) [حساب التفاضل والتكامل] FBS101 [Calculus]		
Course Content:	<p>Ordinary Differential Equations: Degree and order of ordinary differential equations. Formation of differential equations, Solutions of first order differential equations by various methods. Solutions of general linear equations of second and higher orders with constant coefficients.</p> <p>Solution of homogeneous linear equations. Solution of differential equation of the higher order when the dependent or independent variable is absent. Solution of differential equation by the method based on the factorization of the operators. Frobenius method.</p> <p>Partial differential equations: Wave equations, Particular solutions with boundary and initial conditions.</p>		

FCS101	Computer Science Fundamentals	اساسيات علوم الحاسب	فحص ١٠١
Prerequisites:	-		

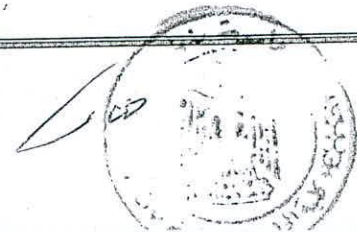


Course Content:	The course presents a broad overview of Computer Science to provide students with an appreciation for and an understanding of the many different aspects of Computer Science. A comprehensive and rigorous exploration of computing is undertaken to lay a solid foundation to support further study. Topics include: Computers and Digital Basics, Numbering systems, Computer Hardware, Computer Software, Operating Systems and File Management, Local Area Networks, Digital Media, The Computer Industry: History, Careers, and Ethics, Information Systems Analysis and Design, Databases, Computer Programming, The Internet, and The Web and E-mail.
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FCS141	Structured Programming	برمجة هيكلية	فمح ١٤١
Prerequisites:	-		
Course Content:	The course presents the fundamental concepts of structured programming and algorithmic problem solving: primitive data types, control structures, functions and parameter passing, top-down design, arrays, files, and the mechanics of compiling, running, testing, and debugging programs.		

FCS142	Object Oriented Programming	برمجة شبيهة	فمح ١٤٢
Prerequisites:	FCS141-[Structured Programming]	[برمجة هيكلية]	فمح ١٤١
Course Content:	The course presents the principles of object-oriented program design and advanced algorithmic problem solving illustrated through an object-oriented language. Topics include encapsulation and information hiding; classes, subclasses, and inheritance; polymorphism; class hierarchies, and the creation, implementation, and reuse of APIs (application programming interfaces).		

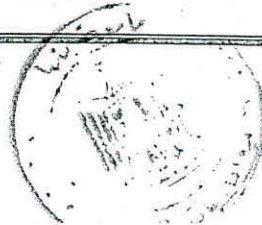
FCS211	Data Structures	هياكل البيانات	فمح ٢١١
Prerequisites:	FCS141-[Structured Programming]	[برمجة هيكلية]	فمح ١٤١
Course Content:	A study of data structures and algorithms for their manipulation; analyzing basic data structure operations. The course introduces and develops methods for designing and implementing abstract data types and structures. Topics include: arrays, stacks, queues, lists, doubly-linked lists, trees, dynamic storage allocation, graphs.		



FCS221 Logic Design		فص ٢٢١ التصميم المنطقي
Prerequisites:	FBS131 [Electronics]	فص ١٣١ [الكثرونيات]
Course Content:	<p>Topics include: Digital logic, Boolean algebra, De-Morgan's law, logic gates and their truth tables, canonical forms, Combinational logic circuits, minimization techniques, Arithmetic and data handling logic circuits, decoders and encoders, Multiplexers and demultiplexers, Combinational Circuit design, Flip-flops, race around problems, Counters and their applications, PLA design, Synchronous and asynchronous logic design: state diagram, Mealy and Moore machines, State minimizations and assignments, Pulse mode logic, Fundamental mode design.</p>	

FIS201 Introduction to Information Systems		فص ٢٠١ مقدمة في نظم المعلومات
Prerequisites:	FCS101 [Computer Science Fundamentals]	فص ١٠١ [أساسيات علوم الحاسب]
Course Content:	<p>Topics include: Information systems components. Information systems in organizations: Characteristics of IS professionals, IS career paths, Cost/value information, Quality of information, competitive advantage of information, IS and organizational strategy, Value chains and networks. Globalization. Valuing information systems: Investment evaluation, Multi-criteria analysis, Cost-benefit analysis, Identifying and implementing innovations. E-business: B-to-C, B-to-B, Intranets, Internet, extranets, E-government, Web 2.0 Technologies: e.g., wikis, tags, blogs, netcasts, self-publishing, New forms of collaboration. social networking, virtual teams, viral marketing crowd-sourcing. Security of information systems: Threats to information systems, Technology-based safeguards. Business intelligence: Organizational decision making, functions, and levels, Executive, managerial, and operational levels, Systems to support organizational functions and decision making. Information and knowledge discovery: Reporting systems, Online analytical processing, Data, text, and Web mining, Business analytics. Application systems: Executive, managerial, and operational support systems, Decision support systems.</p>	

FCS222 Computer Architecture		فص ٢٢٢ بناء الحاسب
Prerequisites:	FCS221 [Logic Design]	
Course Content:	<p>The architecture and organization of a simple computer system is studied. Topics covered include information representation and transfer, instruction and data access methods, the control unit: hardwired and microprogrammed, memory organization, I/O systems, channels, interrupts, DMA, Von Neumann SISO organization, RISC and CISC machines. Pipelined machines, interleaved memory system, caches, Hardware</p>	

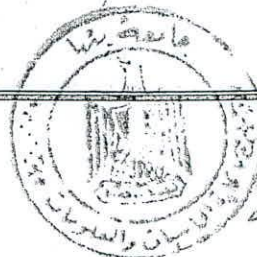


	and architectural issues of parallel machines, Array processors, associative processors, multiprocessors, systolic processors, data flow computers and interconnection networks, High level language concept of computer architecture.
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FIS231	Systems Analysis and Design	فتم ٢٣١ تحليل وتصميم النظم
Prerequisites:	FCS101 [Computer Science Fundamentals]	فمح ١٠١ [أساسيات علوم الحاسب]
Course Content:	This course presents a comprehensive introduction to the systems design skills in information management that students, as future users and/or systems analysts, will need to deal with in a computer-integrated business environment. The course provides the students with the skills to identify business problems which may be solved by technology-based solutions, determine requirements for information systems solutions, and develop designs which form the basis for implementing systems, as well as a strong foundation in systems analysis and design concepts, skills, methodologies, techniques, and tools.	

FCS223	Operating Systems	فمح ٢٢٣ نظم التشغيل
Prerequisites:	FCS101 [Computer Science Fundamentals]	فمح ١٠١ [أساسيات علوم الحاسب]
Course Content:	Topics include: Principles of operating systems, design objectives, sequential processes, concurrent processes, concurrency, functional mutual exclusion, processor cooperation and deadlocks, processor management, Control and scheduling of large information processing systems, Resource allocation, dispatching, processor access methods, job control languages, Memory management, memory addressing, paging and store multiplexing, Multiprocessing and time sharing, batch processing, Scheduling algorithms, file systems, protection and security, design and implementation methodology, performance evaluation and case studies.	

FCS231	Introduction to Computer Networks	فمح ٢٣١ مقدمة في شبكات الحاسب
Prerequisites:	FCS101 [Computer Science Fundamentals]	فمح ١٠١ [أساسيات علوم الحاسب]
Course Content:	Topics include: Architecture and protocols of computer networks. Protocol layers; network topology; data-communication principles, including circuit switching, packet switching and error control techniques; sliding window protocols, protocol analysis and verification; routing and flow control; local and wide area networks; network	



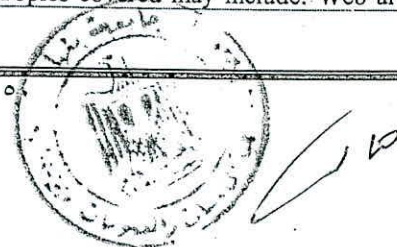
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	interconnection; client-server interaction; emerging networking trends and technologies; topics in security and privacy.
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FCS312	File Organization	فمع ٣١٢ تنظيم الملفات
Prerequisites:	FCS211 [Data Structures]	فمع ٢١١ [مبائل البنات]
Course Content:	This course shows the students how to design and implement efficient file structures that are easy for application programmers to use. It helps them gain familiarity with the tools used to organize files. The course provides the conceptual tools that enable students to think through alternative file structure designs that apply to the task at hand. It also develops the programming skills necessary to produce quality implementations. Topics include: simple I/O, methods for transferring objects between memory and files, sequential and direct access, the characteristics of secondary storage, indexing, sequential processing, B trees, B+ trees, hashing, and extendible hashing.	

FCS313	Design and Analysis of Algorithms	فمع ٣١٣ تصميم وتحليل الخوارزميات
Prerequisites:	FCS211 [Data Structures]	فمع ٢١١ [مبائل البنات]
Course Content:	Topics covered may include: Techniques for analysis of algorithms: asymptotic notation (Big-Oh, little-oh, and Theta) for estimating the complexity of a problem, using recurrence relations to analyze the complexity of recursive algorithms, searching, sorting, and depth- and breadth-first search in graphs, Methods for the design of efficient algorithms: divide and conquer, greedy method, dynamic programming, back tracking, branch and bound, Basic search and traversal techniques, graph algorithms, Algebraic simplification and transformations, lower bound theory, NP-hard and NP-complete problems.	

FCS343	Web Programming	فمع ٣٤٣ برمجة الويب
Prerequisites:		
Course Content:	This course is designed to provide the student with foundational programming knowledge and skills for application development on the Internet. The student will learn about the Web as a development platform through the use of popular representative languages (such as PHP). The student will learn to plan, design, construct, and integrate basic server-side components of modern web applications including databases and scripts. Topics covered may include: Web architecture and	



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<p>HTTP: History and architecture of the World Wide Web, overview of the Hyper Text Transfer Protocol, other related protocols; Hyper Text Markup Language: The concept of markup, overview of HTML (table, form, frame, window, link etc.); Client side scripting: Variables, data types, control structure, functions, Document Object Model (DOM), event handlers, properties, methods, cookies; Server side scripting: Concepts, variables, data types, control structure, functions, objects; Database: Content generation, data exchange; Regular expressions, mails, cookies, sessions.</p>

ثالثا: متطلبات التخصص (٦٦) ساعة معتمدة

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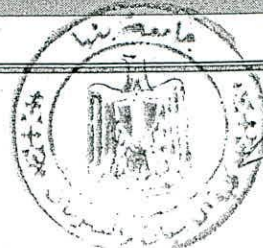
أ- علوم تطبيقية (٥٧) ساعة معتمدة:

• (٤٢) ساعة معتمدة إجبارية مقسمة كالتالي:

FIS311	Databases	قواعد البيانات	فم ٣١١
Prerequisites:	FIS231 [Systems Analysis and Design]		
Course Content:	Topics covered may include: Concepts and methods in database system, File organization and retrieval, Data manipulation, Query formulation and language, Database models, Data description languages, database integrity and security, Data dictionary/directory systems, database administration, Database design, Survey of some existing database management systems, some applications using commercial languages.		

FCS361	Artificial Intelligence	النكاء الاصطناعي	فم ٣٦١
Prerequisites:	-		
Course Content:	Topics covered may include: Survey and concepts in Artificial Intelligence, Problem solving agents, Uniformed and informed search techniques, Game playing, Knowledge representation, propositional and First Order logic. Theorem proving, Decision trees, neural networks, fuzzy logic, expert systems, machine learning, etc.		

FCS332	Advanced Computer Networks	شبكات الحاسب المتقدمة	فم ٣٣٢
Prerequisites:	FIS231 [Introduction to Computer Networks]		



Course Content:	This course is intended to provide students with a solid understanding of the state of the art in computer network systems and protocols. Topics are covered in some depth, including both abstract and concrete aspects. Topics covered may include: Review of the OSI reference model. Logical link control. HDLC. Multiplexing. WANs. ATM. Frame relay. Ethernet LANs and VLANs. Wireless LANs.
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FCS381	Introduction to Digital Forensics	مقدمة في الأدلة الجنائية الرقمية	فمح ٣٨١
Prerequisites:	-		
Course Content:	Skills-based course introducing the digital forensics process, including evidence processing, preservation, analysis, and presentation. Also includes digital evidence basics, data recovery, and some cyber law issues. In this course, students will learn the fundamental process of analyzing data collected from electronic devices (including computers, media, and other digital evidence). Students will become familiar with proper techniques and tools utilized for securing, handling and preserving digital and multimedia evidence at physical crime scenes. Students will utilize examination and chain of custody forms, as well as prepare crime scene and digital acquisition reports related to administrative, civil and criminal investigations.		

FCS391	Software Engineering	هندسة البرمجيات	فمح ٣٩١
Prerequisites:	FCS313 [Design and Analysis of Algorithms]	[تصميم وتحليل الخوارزميات]	فمح ٣١٣
Course Content:	This course is designed to provide the student with principles and techniques for the design and construction of reliable, maintainable, and useful software systems. Software life cycle, requirements specifications, and verification and validation issues. Implementation strategies (e.g., top-down, bottom-up, teams), support for reuse, and performance improvement. Topics covered may also include: concepts of software engineering: requirements definition, modularity, structured design, data specifications, functional specifications, verification, documentation, software maintenance, Software support tools, Software project organization, quality assurance, management and communication skills.		

FCS351	Computer Graphics	الرسم بالحاسب	فمح ٣٥١
Prerequisites:	FBS203 [Linear Algebra]	[جبر خطي]	فمح ٢٠٣

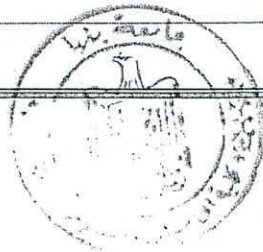


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Course Content:	Topics covered include: introduction to Graphical data processing, Fundamentals of interactive graphics programming, Architecture of display devices and connectivity to a computer, Implementation of graphics concepts of two-dimensional and three-dimensional viewing, clipping and transformations, Hidden line algorithms, Raster graphics concepts: Architecture, algorithms and other image synthesis methods, Design of interactive graphic conversations.
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FCS344	Mobile Applications Development	فصح ٣٤٤ تطوير تطبيقات الهاتف المحمول
Prerequisites:	FCS141 [Structured Programming]	فصح ١٤١ [برمجة هيكلية]
Course Content:	This course introduces the mobile programming for developing interactive mobile applications. Topics include Software Overview: API levels, installation, ADT and IDE, App stores: Google Play, iTunes, Amazons etc., Basic Building Blocks of a Mobile Application: Application framework, components, MVC architecture, User Interfaces: Basic user interfaces, advanced user interface, widgets and layouts, Activity and Activity Lifecycle: Passing data between activities, intents, advanced system components, Database (SQLite), Networking, Multimedia and Content Providers: importing images, email/SMS, call Mapping and Location Based. Students participate in both individual assignments and group projects to practice ideation, reading, writing, coding, and presentation.	

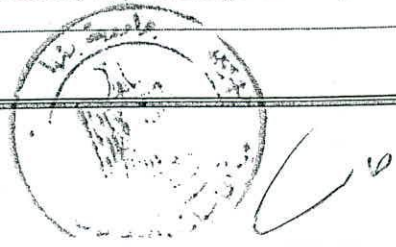
FCS452	Image Processing	فصح ٤٥٢ معالجة الصور
Prerequisites:	FCS313 [Design and Analysis of Algorithms]	فصح ٣١٣ [تصميم وتحليل الخوارزميات]
Course Content:	Digital image fundamentals: Visual perception, sensing, acquisition, sampling, quantization. Intensity transformation and spatial filtering: Different transformations, histogram, correlation and convolution, smoothing and sharpening filters. Filtering in frequency domain: Discrete-Fourier-Transformation (DFT) of image, smoothing and sharpening in frequency domain, selective filtering. Image restoration and reconstruction: Noise models, spatial filtering for noise, frequency filtering for noise reconstruction from projections. Color image processing: Color image transformation and segmentation. Morphological image processing: binary image processing, opening, closing, morphological algorithms. Image compression: Redundancy, entropy, criteria, some basic compression techniques. Image segmentation: Region growing and edge detection, thresholding, region based segmentation. Object recognition: Matching, statistical classifier, neural networks. Analysis, design and visualization tools: MATLAB, IP toolbox, CV toolbox.	



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FIS445	Open Source Software Development	تطوير البرمجيات مفتوحة المصدر رقم ٤٤٥
Prerequisites:	FCS142 [Object Oriented Programming]	
Course Content:	<p>This course provides a theoretical foundation of the history, key concepts, technologies, and practices associated with modern Free and Open Source Software (FOSS) projects. The objectives of this course are to introduce students to open source software. Students will study common open source software licenses, open source project structure, distributed team software development, and current events in the open source world. The course also covers topics such as: the need for and benefits of free and open-source software; open-source licensing and business models; intellectual property; and humanitarian free and open-source software (HFOSS).</p>	

FCS472	Network Security	أمن الشبكات رقم ٤٧٢
Prerequisites:	FCS332 [Advanced Computer Networks]	
Course Content:	<p>Computer Security Concepts: OSI security architecture, security attacks, security services, security mechanisms, network security model.</p> <p>Classical Encryption Techniques: symmetric cipher model, cryptanalysis, substitution techniques (Caesar, Monoalphabetic, Playfair, Hill cipher), transposition techniques, rotor machines, steganography. BlockCiphers and the Data Encryption Standard (DES): block cipher principles, Data Encryption Standard (DES), strength of DES, differential and linear cryptanalysis.</p> <p>Public-Key Cryptography and RSA: principles of public-key cryptosystems, RSA algorithm.</p> <p>Diffie-Hellman Key Exchange: Discrete logarithm, key exchange and generation in Diffie-Hellman protocol.</p> <p>Cryptographic Hash Functions: requirements and security, hash functions based on Cipher Block Chaining (CBC), Secure Hash Algorithm (SHA).</p> <p>Digital Signatures: essential elements, limitations of symmetric key, Digital Signature Standard (DSS). Distribution of public keys and X.509.</p> <p>Network Security Protocols: Authentication, key exchange and key distribution protocols.</p>	

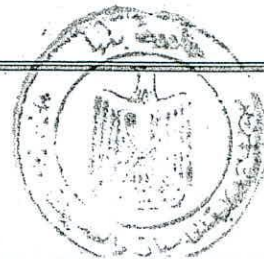


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<p>Network Security Standards: IP security (IPsec), Secure Sockets Layer (SSL), Transport Layer Security (TLS), Hypertext Transfer Protocol Secure (HTTPS).</p> <p>Security analysis: Use of formal tools, e.g., Automated Validation of Internet Security Protocols and Applications (AVISPA).</p>

FCS433	Cloud Computing	فمع ٤٣٣ الحوسبة السحابية
Prerequisites:	FCS332 [Advanced Computer Networks]	فمع ٣٣٢ [شبكات الحاسب المتقدمة]
Course Content:	<p>Overview of Distributed Computing: Trends of computing, introduction to distributed computing, next big thing: Cloud computing.</p> <p>Introduction to Cloud Computing: Cloud computing properties and characteristics, service models, deployment models.</p> <p>Attributes of Cloud computing: Multi-tenancy – a single instance of software or other computing resource serving several clients, massive scalability – ability to support hundreds of thousands of clients at the same time, elasticity – ability to grow or contract on demand, on-demand self-provisioning of resources.</p> <p>Infrastructure-as-a-Service (IaaS): Introduction to IaaS, resource (i.e., server, storage and network) virtualization, case studies.</p> <p>Platform-as-a-Service (PaaS): Introduction to PaaS. Cloud platform, management of computation and storage, case studies.</p> <p>Software-as-a-Service (SaaS): Introduction to SaaS, Web services, Web 2.0, Web OS, case studies.</p> <p>Cloud issues and challenges: Cloud provider lock-in or vendor lock-in, security of Cloud computing.</p>	

FCS482	Image Forensics	فمع ٤٨٢ اكتشاف الأدلة الخفية في الصور
Course Content:	<p>This course provides the students with basic principles of forensic analysis for digital images. Topics covered may include: Introduction to Computational Forensics and to Document/Image Forensics, Historical Aspects in Image Forensics, Traditional and Modern Techniques for Image Manipulation, Searching for Suspects through</p>	



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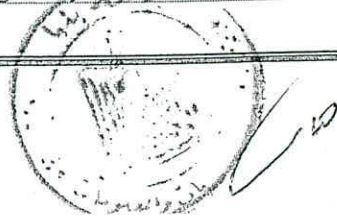
	Mugshots and Image attributes, Digital Image Forensics: Passive and Blind Analysis versus Watermarking, Taxonomy of image forgery detection techniques.
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FCS473	Secure Programming	البرمجة الآمنة	فم ٤٧٣
Prerequisites:	FCS371 [Cryptography]		فم ٣٧١ [علم التشفير]
Course Content:	The course introduces the secure software development process including designing secure applications, writing secure code that can withstand attacks, and security testing and auditing. It focuses on the security issues a developer faces, common security vulnerabilities and flaws, and security threats. The course explains security principles, strategies, coding techniques, and tools that can help make code more resistant to attacks. Students will write and analyze code that demonstrates specific security development techniques.		

• (١٥) ساعة يختارها الطالب من بين المقررات الاختيارية التالية:

FIS374	Computer Security	أمن الحاسب	فم ٣٧٤
Prerequisites:			
Course Content:	The course gives a broad overview of the security area. It introduces computer security, both in the abstract and in the context of real systems, including recognizing potential threats to confidentiality, integrity and availability, and developing familiarity with current security-related issues in computer science. Roughly, security deals with how to protect your system against intentional intrusions and attacks. The purpose of intrusions can be made to change or delete resources (data, programs, hardware, etc.), to get unauthorized access to confidential information or unauthorized use of the system's services. The course covers threats and vulnerabilities as well as rules, methods and mechanisms for protection. Foundations of modern computer security, including software security, operating system security, network security, applied cryptography, human factors, authentication, anonymity, and web security.		

FCS383	File System Forensics	اكتشاف الأدلة الجنائية في نظام الملفات	فم ٣٨٣
Prerequisites:	FCS381 [Introduction to Digital Forensics]		فم ٣٨١ [مقدمة في الأدلة الجنائية الرقمية]
Course Content:	This course provides the students with a practical knowledge of the elements of digital forensics as it relates to parsing and understanding file system structure and use. File		



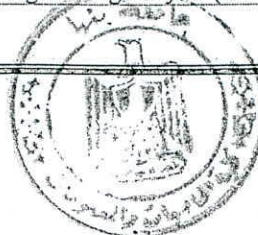
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	systems are the underlining structures of hardware systems and are used as a method of storing and organizing computer files and their data. Topics covered may include: Forensic analysis and reconstruction of digital evidence found in modern file systems, Make use of forensic tools to analyze the FAT, NTFS and ext file systems, Identify the important data structures on the FAT, NTFS, ext and HFS+ file systems, Examine the structure of a disk drive including the boot record, partition table and slack space, Make use of forensic tools to acquire forensically sound images of disk drives
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FCS384	Operating System Forensics	اكتشاف الأدلة الجنائية الرقمية في نظام التشغيل	فمح ٣٨٤
Prerequisites:	FCS223 [Operating Systems]		فمح ٢٢٣ [نظم التشغيل]
Course Content:	The course covers digital forensic investigations of the three major operating systems, including Windows, Linux, and Mac OS. It presents the technical details of each operating system, allowing users to find artifacts that might be missed using automated tool. Topics covered may include: Forensics and Operating Systems, File Systems, Data and File Recovery, Memory Forensics, System Configuration, Web Browsing, Tracking Artifacts, Log Files, Executable Programs, and Malware.		

FCS475	Cyber Security	الأمن السيبراني	فمح ٤٧٥
Prerequisites:	FCS371 [Cryptography]		فمح ٣٧١ [علم التشفير]
Course Content:	This course provides an overview of Cyberspace, defines the scope of Cybersecurity, and addresses information classification and system compartmentalization. Course includes an appreciation of information confidentiality, integrity, and availability, and covers Cybersecurity architecture, strategy, services, hardware, software, and cloud services. The course also examines national security issues, critical infrastructure, and the potential for cybercrime and cyber terrorism, as well as the need for corporations to align their security with business needs and consider the threat from malicious employees, contractors, and/or vendors.		

FCS476	Steganography		فمح ٤٧٦
Prerequisites:	FCS371 [Cryptography]		[علم التشفير]
Course Content:	Digital steganography is the science of hiding covert information in otherwise innocent carrier files so that the observer is unaware that hidden information exists. This course studies both digital steganography and digital steganalysis (the science of discovering		



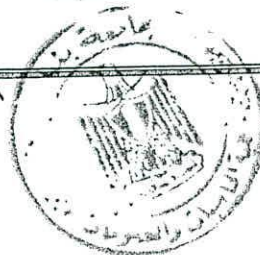
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the existence of and extracting the covert information). In addition to understanding the science and the pathologies of specific carriers and hiding algorithms, participants will have hands-on experience with tools to both hide and extract information. Carrier files such as image, audio, and video files will be investigated. Topics covered may include: Introduction to Steganography, Privacy, Transposition and Substitution Ciphers, Rotor Machine and Polyalphabetic Ciphers, Digital Signatures and Authentication, Public Key Systems, RSA System, Stream Ciphers, Pseudorandom generators, Steganography, Steganographic tools, Digital watermarking.

FCS477	Ethical Hacking	الاختراق الأخلاقي	فج ٧٧٤
Prerequisites:			
Course Content:	<p>This course introduces students to the principles and techniques of the cybersecurity practice known as penetration testing (pen testing), or ethical hacking, and covers the full pen test life cycle. Students discover how system vulnerabilities can be exploited and learn how to avoid such problems. Students will review various tools and methods commonly used to compromise information and control systems. Ethical hacking, also known as penetration testing, is the act of breaking into a system with the permission and legal consent of the organization or individual who owns and operates the system, with the purpose of identifying vulnerabilities to strengthening the organization's security. Students will conduct hands-on penetration tests in a lab environment to practice the concepts presented and tools reviewed in the course. This course is an ethical hacking course and students will learn hacking techniques within a controlled environment for the goal of better securing the IT resources of their rightful owners.</p>		

FCS478	Selected Topics in Information Security	موضوعات مختارة في أمن المعلومات	فج ٧٨٤
Prerequisites: Varies with the topics			
Course Content:	<p>Topics are selected from different areas in Information Security that are not covered in the description of the courses listed in the curriculum. This course will cover recent trends and issues in the field of Information Security and will be chosen at the discretion of the Program Administration Council and the Faculty Council.</p>		

FCS485	Mobile Device Forensics	أدوات الأداة الجنائية الرقمية في الأجهزة المحمولة	فج ٢٨١ [مقدمة في الأداة الجنائية الرقمية]
Prerequisites: FCS381 [Introduction to Digital Forensics]			



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Course Content:	Students in this course will learn how to properly identify, preserve, analyze, examine data and report on mobile device data. Students will also be taught how to effectively conduct investigations involving mobile devices. Content will include analog and digital telephone networks and technologies surrounding cellular technology. Concepts of off the chip extraction and analysis will be discussed.
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FCS486	Selected Topics in Digital Forensics	موضوعات مختارة في اكتشاف الآلة الجنائية الرقمية	فم ٤٨٦
Prerequisites:	Varies with the topics		
Course Content:	Topics are selected from different areas in Digital Forensics that are not covered in the description of the courses listed in the curriculum. This course will cover recent trends and issues in the field of Digital Forensics and will be chosen at the discretion of the Program Administration Council and the Faculty Council.		

FPR401	Capstone Project I	مشروع التخرج ١	فم ٤٠١
Prerequisites:	-		
Course Content:	<p>The purpose is for students to undertake an independent project that applies and synthesizes what they have learned in their major. This course is typically taken in the first of the student's final two semesters.</p> <p>During the first of the two terms, students will begin their work on the project and are expected to complete at least half the project by the end of the term. Students will develop and work on their projects under faculty supervision.</p>		

FPR402	Capstone Project II	مشروع التخرج ٢	فم ٤٠٢
Prerequisites:	FPR401 Capstone Project I		
Course Content:	<p>The purpose is for students to undertake a collaborative group project that applies and synthesizes what they have learned in their major. This course is typically taken in the second of the student's final two semesters.</p> <p>Students will spend the second full term working on their collaborative group project from Capstone Project I. Students will then be required to present their completed projects during the on-campus immersion.</p>		



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One outcome will be a software package. A second outcome is a written full documentation of their project. A third outcome is a presentation of their work to the students and the faculty members.



المراجع الخاصة ببرنامج "أمن المعلومات واكتشاف الأدلة الجنائية الرقمية"

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