المناهج الدراسية لفرع البرامجيات
2017-2018

First Year – First Semester					
Code	Title	Hours / Week			
		Lect.	Lab.	Disc.	Units
CSC01	Structured Programming I	3	2	1	4
CSC03	Mathematics I	2	-	1	2
CSC05	Discrete Structure I	2	-	-	2
CSC07	Computer Organization	2	-	1	2
CSC09	Introduction to Statistics	2	-	1	2
CSC51	English Language I	2	-	-	1
CSS01	Fundamental of Programming Techniques	2	-	-	2
Totals		15	2	4	15

First Year – Second Semester					
Code	Title	Hours / Week			
		Lect.	Lab.	Disc.	Units
CSC02	Structured Programming II	3	2	1	4
CSC04	Mathematics II	2	-	1	2
CSC06	Discrete Structure II	2	-	-	2
CSC08	Logic Design	2	2	1	3
CSC10	Probability Theory	2	-	1	2
CSS02	Software Development Fundamentals	2	-	-	2
CSC45	Software Engineering I	2	2	-	3
Total		15	6	4	18

Total No. of Unit for first Course: (15)Units

Total No. of Unit for Second Course: (18)Units

Total No. of Unit for Year: (33) Units

Total No. of Unit for Specialist Courses: (7)Units

المرحلة الاولى – الفصل الاول					
رمز الدرس	عنوان الدرس	عدد الساعات في الاسبوع			
		النظري	العملي	المناقشة	الوحدات
CSC01	برمجة مهيكلة 1	3	2	1	4
CSC03	رياضيات 1	2	-	1	2
CSC05	هياكل متقطعة 1	2	-	-	2
CSC07	تركيب حاسوب	2	-	1	2
CSC09	مقدمة الى الاحصاء	2	-	1	2
CSS01	اساسيات تقنيات البرمجة	2	-	-	2
CSC51	لغة انكليزية 1	2	-	-	1

المرحلة الاولى – الفصل الثاني					
رمز الدرس	عنوان الدرس	عدد الساعات في الاسبوع			
		النظري	العملي	المناقشة	الوحدات
CSC02	برمجة مهيكلة 2	3	2	1	4
CSC04	رياضيات 2	2	-	1	2
CSC06	هياكل متقطعة 2	2	-	-	2
CSC08	تصميم منطقي	2	2	1	3
CSC10	نظرية احتمالات	2	-	1	2
CSS02	اساسيات تطور البرمجيات	2	-	-	2
CSC45	هندسة البرمجيات 1	2	2	-	3

Second Year – First Semester					
Code Lab.	Title Disc.	Hours / Week			
		Lect.	Lab.	Disc.	Units
CSC11	Object Oriented Programming 1	2	2	1	3
CSC13	Data Structures	2	2	1	3
CSC15	Mathematics 3	2	2	1	3
CSC17	Database Foundation	2	2	1	3
CSC19	Human Rights	2	-	-	1
CSC52	English Language 2	2	-	-	1
CSC46	Software Engineering 2	2	2	1	3
Totals		14	10	5	17

Second Year – Second Semester					
Code Lab.	Title Disc.	Hours / Week			
		Lect.	Lab.	Disc.	Units
CSC12	Object oriented programming2	2	2	1	3
CSC14	Sorting and Searching Algorithms	2	2	1	3
CSC16	Numerical Analysis	2	2	1	3
CSC18	DataBase Design	2	2	1	3
CSC20	Democracy	2	-	-	1
CSS03	Analysis and Design of Algorithms	2	2	-	3
CSS04	Computational Complexity	2	-	-	2
Totals		14	10	4	18

Total No. of Unit for first Course: (17)Units

Total No. of Unit for Second Course: (18)Units

Total No. of Unit for Year: (35) Units

Total No. of Unit for Specialist Courses: (8)Units

المرحلة الثانية – الفصل الاول					
رمز الدرس	عنوان الدرس	عدد الساعات في الاسبوع			
		النظري	العملي	المناقشة	الوحدات
CSC11	برمجة شيئية 1	2	2	1	3
CSC13	هياكل بيانات	2	2	1	3
CSC15	رياضيات 3	2	2	1	3
CSC17	اساسيات قواعد البيانات	2	2	1	3
CSC56	هندسة برمجيات 2	2	2	1	3
CSC19	حقوق انسان	2	-	-	1
CSC52	لغة انكليزية 2	2	-	-	1

المرحلة الثانية – الفصل الثاني					
رمز الدرس	عنوان الدرس	عدد الساعات في الاسبوع			
		النظري	العملي	المناقشة	الوحدات
CSC12	برمجة شيئية 2	2	2	1	3
CSC14	خوارزميات البحث والترتيب	2	2	1	3
CSC16	تحليل عددي	2	2	1	3
CSC18	تصميم قواعد بيانات	2	2	1	3
CSS03	تحليل وتصميم خوارزميات	2	2	-	3
CSS04	احتساب التعقيد	2	-	-	2
CSC20	ديمقراطية	2	-	-	1

Third Year Syllabus

منهاج المرحلة الثالثة

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	Subject	اسم المادة	ت
3	1	2	2	Computer Graphics	رسوم الحاسوب	1
3	-	2	2	Compilers	المترجمات	2
3	1	2	2	Advanced Databases	قواعد البيانات متقدمة	3
3	1	2	2	Microprocessor and Computer Architecture	معالجة مايكروية و معمارية الحاسوب	4
3	1	2	2	Artificial Intelligent	الذكاء الاصطناعي	5
2	1	-	2	Operation Research	بحوث عمليات	6
3	1	2	2	Computer Networks	شبكات الحاسوب	7
3	1	2	2	Algorithms & Complexity	الخوارزميات وتعقيداتها	8
23	7	14	16			

Total No. of Unit for One Semester: **(23)**Units
Total No. of Unit for Year: **(46)** Units

مجموعة الوحدات للفصل الدراسي الواحد: (**23**) وحدة
مجموعة الوحدات لسنة دراسية: (**46**) وحدة

Forth Year Syllabus

منهاج المرحلة الرابعة

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	Subject	اسم المادة	ت
2	1	-	2	Computer and Data Security	امنية الحاسبات والبيانات	1
3	1	2	2	Windows Programming	برمجة نوافذ	2
3	1	2	2	Image Processing	معالجة صور	3
3	1	2	2	Operating System	نظم التشغيل	4
3	1	2	2	Intelligence Applications	تطبيقات ذكية	5
3	1	2	2	Web programming	برمجة المواقع	6
2	1	-	2	Modeling and Simulation	النمذجة والمحاكاة	7
3	-	4	1	Project	المشروع	8
22	7	14	15			

Total No. of Unit for One Semester: **(22)**Units
Total No. of Unit for Year: **(44)** Units

مجموعة الوحدات للفصل الدراسي الواحد: (22) وحدة
مجموعة الوحدات لسنة دراسية: (44) وحدة

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2017-2018

المناهج الدراسية لفرع نظم المعلومات

للعام الدراسي ٢٠١٧-

٢٠١٨

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First Year – First Semester					
Subject Code	Subject in English	Number of Hours / Week			
		Theory	Lab	Tutorial	Units
CSC01	Structured Programming 1	3	2	1	4
CSC03	Mathematics 1	2	-	1	2
CSC05	Discrete Structure 1	2	-	-	2
CSC07	Computer Organization	2	-	1	2
CSC09	Introduction to Statistics	2	-	1	2
CSI٠١	Information System	2	-	-	2
CSC51	English Language 1	2	-	-	1
		15	2	4	15

First Year – Second Semester					
Subject Code	Subject in English	Number of Hours / Week			
		Theory	Lab	Tutorial	Units
CSC02	Structured Programming 2	3	2	1	4
CSC04	Mathematics 2	2	-	1	2
CSC06	Discrete Structure 2	2	-	-	2
CSC08	Logic Design	2	2	1	3
CSC10	Probability Theory	2	-	1	2
CSI٠٢	Information Technology	2	-	-	2
CSI0٣	E - Techniques	2	-	-	2
		15	4	4	17

Total No. of Unit for first Course: (15)Units

Total No. of Unit for Second Course: (17)Units

Total No. of Unit for Year: (32) Units

Total No. of Unit for Specialist Courses: (6)

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المرحلة الاولى – الفصل الاول					
رمز الدرس	عنوان الدرس	عدد الساعات في الاسبوع			
		النظري	العملي	المناقشة	الوحدات
CSC01	برمجة مهيكلة ١	3	2	1	4
CSC03	رياضيات ١	2	-	1	2
CSC05	هياكل متقطعة ١	2	-	-	2
CSC07	تركيب حاسوب	2	-	1	2
CSC09	مقدمة الى الاحصاء	2	-	1	2
CSI٠١	نظم معلومات	2	-	-	2
CSC51	لغة انكليزية ١	2	-	-	1

المرحلة الاولى – الفصل الثاني					
رمز الدرس	عنوان الدرس	عدد الساعات في الاسبوع			
		النظري	العملي	المناقشة	الوحدات
CSC02	برمجة مهيكلة ٢	3	2	1	4
CSC04	رياضيات ٢	2	-	1	2
CSC06	هياكل متقطعة ٢	2	-	-	2
CSC08	تصميم منطقي	2	2	1	3
CSC10	نظرية احتمالات	2	-	1	2
CSI٠٢	تكنولوجيا معلومات	2	-	-	2
CSI0٣	تقنيات الكترونية	2	-	-	2

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Second Year – First Semester					
Subject Code	Subject in English	Number of Hours / Week			
		Theory	Lab	Tutorial	Units
CSC11	Object Oriented Programming 1	٢	2	1	3
CSC13	Data Structures	2	2	1	3
CSC15	Mathematics 3	2	2	1	3
CSC17	Database Foundation	2	2	1	3
CSI04	Projects Management	2	-	1	2
CSC19	Human Rights	2	-	-	1
CSC52	English Language 2	2	-	-	1
		14	8	5	16

Second Year – Second Semester					
Subject Code	Subject in English	Number of Hours / Week			
		Theory	Lab	Tutorial	Units
CSC12	Object oriented programming2	٢	2	1	٣
CSC14	Sorting and Searching Algorithms	2	٢	1	٣
CSC16	Numerical Analysis	2	٢	1	3
CSC18	DataBase Design	2	2	1	3
CSI05	System Analysis and Design	2	2	-	3
CSI06	IT Projects Management	2	2	-	3
CSC20	Democracy	2	-	-	1
		14	12	4	19

Total No. of Unit for first Course: (16)Units

Total No. of Unit for Second Course: (19)Units

Total No. of Unit for Year: (35) Units

Total No. of Unit for Specialist Courses: (8)Units

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المرحلة الثانية – الفصل الاول					
رمز الدرس	عنوان الدرس	عدد الساعات في الاسبوع			
		النظري	العملي	المناقشة	الوحدات
CSC11	برمجة شيئية ١	٢	2	1	3
CSC13	هياكل بيانات	2	2	1	3
CSC15	رياضيات ٣	2	2	1	3
CSC17	اساسيات قواعد البيانات	2	2	1	3
CSI04	ادارة مشاريع	2	-	1	2
CSC19	حقوق انسان	2	-	-	1
CSC52	لغة انكليزية ٢	2	-	-	1

المرحلة الثانية – الفصل الثاني					
رمز الدرس	عنوان الدرس	عدد الساعات في الاسبوع			
		النظري	العملي	المناقشة	الوحدات
CSC12	برمجة شيئية ٢	٢	2	1	٣
CSC14	خوارزميات البحث والترتيب	2	٢	1	٣
CSC16	تحليل عددي	2	٢	1	3
CSC18	تصميم قواعد بيانات	2	2	1	3
CSI05	تحليل وتصميم نظم	2	2	-	3
CSI06	ادارة مشاريع تقنية المعلومات	2	2	-	3
CSC20	ديمقراطية	2	-	-	1

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Third Year Syllabus

منهج المرحلة الثالثة

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	Subject	اسم المادة	ت
3	1	2	2	Computer Graphics	رسوم الحاسبة	١
3	-	2	2	Compilers	المترجمات	٢
3	1	2	2	Distributed Databases	قواعد البيانات الموزعة	٣
3	1	2	2	Computer Architecture and Microprocessing	معمارية الحاسبة و المعالجة المايكروية	٤
3	1	2	2	Artificial Intelligent	الذكاء الاصطناعي	٥
3	1	2	2	Computer Networks	شبكات الحاسبة	٦
3	1	2	2	Project Management	ادارة مشاريع	٧
2	1	-	2	Operation Research	بحوث عمليات	٨
٢٣	٧	١٤	١٦			

مجموعة الوحدات للفصل الدراسي الواحد: (٢٣) وحدة

Total No. of Unit for One Semester: **(23)**Units

مجموعة الوحدات لسنة دراسية: (٤٦) وحدة

Total No. of Unit for Year: **(46)** Units

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Fourth Year Syllabus

منهج المرحلة الرابعة

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	Subject	اسم المادة	ت
2	1	-	2	Management Information Systems	نظم ادارة المعلومات	١
3	1	2	2	Advanced Databases	قواعد بيانات متقدمة	٢
3	1	2	2	Intelligent Systems	الانظمة الذكية	٣
2	1	-	2	Computer and Data Security	امنية الحاسبات والبيانات	٤
3	1	2	2	Operating System	نظم التشغيل	٥
3	1	2	2	and Web Programming Ecommerce	برمجة مواقع والتجارة الالكترونية	٦
3	1	2	2	Image processing	معالجة صور	٧
3	-	3	1	Project	مشروع	٨
٢٢	٧	١٣	١٥			

Total No. of Unit for One Semester: **(22)**Units مجموعة الوحدات للفصل الدراسي الواحد: (٢٢) وحدة

Total No. of Unit for Year: **(44)** Units مجموعة الوحدات لسنة دراسية: (٤٤) وحدة

المناهج الدراسية لفرع الذكاء الاصطناعي

2018-2017

University of Technology
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First year Syllabus

منهج المرحلة الاولى

First course

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	رمز المادة Subject Code	Subject	اسم المادة	ت
4	1	2	3	CSCL1101	Structured Programming I	البرمجة المهيكلة1	1
2	1	-	2	CSCL1103	Mathematics I	الرياضيات1	2
2	1	-	2	CSCL1105	Discrete Structures I	الهياكل المتقطعة 1	3
2	1	-	2	CSCL1107	Computer Organization	تركيب الحاسوب	4
2	1	-	2	CSCL1109	Introduction to Statistics	مدخل الى الاحصاء	5
2	1	-	2	CSAI1101	Introduction to A.I	مقدمة الى الذكاء الاصطناعي	6
1	-	-	2	CSCL1111	English Language 1	اللغة الانكليزية 1	7
15	6	2	15		Total		

Total No. of Unit for 1st Semester: **(15)**Units

مجموعة الوحدات للفصل الدراسي الاول: (15) وحدة

Second Course

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	رمز المادة Subject Code	Subject	اسم المادة	ت
4	1	2	3	CSCL1202	Structured Programming II	البرمجة المهيكلة2	1
2	1	-	2	CSCL1204	Mathematics II	الرياضيات 2	2
2	1	-	2	CSCL1206	Discrete Structures II	الهياكل المتقطعة 2	3
3	1	2	2	CSCL1208	Logic Design	التصميم المنطقي	4
2	1	-	2	CSCL1210	Probabilistic Theory	نظرية الاحتمالات	5
3	1	2	2	CSAI1202	Prolog Language	لغة برولوك	6
2	1	-	2	CSAI1203	Knowledge Representation	تمثيل المعرفة	7
18	7	6	15		Total		

Total No. of Unit for 2nd Semester: **(18)**Units

مجموعة الوحدات للفصل الدراسي الثاني: (18) وحدة

Total No. of Unit for Year: **(33)** Units

مجموعة الوحدات لسنة دراسية: (**33**) وحدة

مجموع الوحدات التخصصية: 7

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Second Year Syllabus **منهج المرحلة الثانية**

First course

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	رمز المادة Subject Code	Subject	اسم المادة	ت
3	1	2	2	CSCL2112	Object Oriented Programming I	برمجة شيئية 1	1
3	1	2	2	CSCL2114	Data Structures	هياكل بيانات	2
2	1	-	2	CSCL2116	Mathematics III	رياضيات 3	3
3	1	2	2	CSCL2118	Database Foundation	اساسيات قواعد البيانات	4
3	1	2	2	CSAI2104	NLP and Python Language	معالجة لغات طبيعية ولغة بايثون	5
1	-	-	1	CSCL2122	English Language II	لغة انكليزية 2	6
1	-	-	2	CSCL2120	Human Rights	حقوق انسان	7
16	5	8	13		Total		

Total No. of Unit for One Semester: **(16)**Units مجموعة الوحدات للفصل الدراسي الواحد: (16) وحدة

Second Course

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	رمز المادة Subject Code	Subject	اسم المادة	ت
3	1	2	2	CSCL2213	Object oriented programming II	برمجة شيئية 2	1
3	1	2	2	CSCL2215	Sorting and Searching Algorithms	خوارزميات البحث والترتيب	2
3	1	2	2	CSCL2217	Numerical Analysis	تحليل عددي	3
3	1	2	2	CSCL2219	DataBase Design	تصميم قواعد بيانات	4
2	1	-	2	CSAI2205	Fuzzy Logic	منطق مضبب	5
3	1	2	2	CSAI2206	Searching Strategies	استراتيجيات البحث	6
1	-	-	1	CSCL2221	Democracy	ديمقراطية	7
18	6	10	13		Total		

Total No. of Unit for One Semester: **(18)**Units مجموعة الوحدات للفصل الدراسي الواحد: (18) وحدة

مجموع الوحدات التخصصية: 8

Total No. of Unit for Year: **(34)** Units مجموعة الوحدات لسنة دراسية: (**34**) وحدة

University of Technology
Computer Sciences Department
Artificial Intelligence Branch

منهج المرحلة الثالثة

Third Year Syllabus

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	رمز المادة Subject Code	Subject	اسم المادة	ت
3	1	2	2	Cs20	Computer Graphics	رسوم الحاسوب	1
3	1	2	2	Cs21	Compilers	المترجمات	2
3	1	2	2	Cs34	Databases	قواعد بيانات	3
3	1	2	2	Cs19	Computer Architecture And micro-processors	معمارية الحاسوب والمعالجات المايكروية	4
3	1	2	2	Cs46	Natural Language Processing	معالجة اللغة الطبيعية	5
3	1	2	2	Cs45	Expert Systems	النظم الخبيرة	6
3	1	2	2	Cs47	Machine learning	تعلم الماكنة	7
2	1	-	2	Cs17	Operations Researches	بحوث عمليات	8
23	8	14	16		Total		

Total No. of Unit for One Semester: **(23)**Units
مجموعة الوحدات للفصل الدراسي الواحد: (23) وحدة
Total No. of Unit for Year: **(46)** Units
مجموعة الوحدات لسنة دراسية: (46) وحدة

Forth Year Syllabus

منهج المرحلة الرابعة

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	رمز المادة Subject Code	Subject	اسم المادة	ت
3	1	2	2	CS49	Planning & Robotics	التخطيط والإنسان الآلي	1
3	1	2	2	CS48	Communications and Computer Networks	الاتصالات وشبكات الحاسوب	2
2	1	-	2	Cs27	Computer and Data Security	امنية الحاسوب والبيانات (أختياري)	3
3	1	2	2	Cs26	Operating Systems	نظم التشغيل	4
2	1	-	2	Cs50	Data Warehouse & Data Mining	مخازن وتنقيب البيانات	5
3	1	2	2	Cs24	Web programming	برمجة مواقع الانترنت (أختياري)	6
3	-	2	2	Cs51	Machine Vision	الرؤيا بالماكنة	7
3	-	4	1	Cs82	Project	مشروع	8
22	6	14	15		Total		

Total No. of Unit for One Semester: **(22)**Units
مجموعة الوحدات للفصل الدراسي الواحد: (22) وحدة
Total No. of Unit for Year: **(44)** Units
مجموعة الوحدات لسنة دراسية: (44) وحدة

University of Technology
Computer Sciences Department
Artificial Intelligence Branch

First year Syllabus

First course — منهج المرحلة الاولى

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	رمز المادة Subject Code	Subject	اسم المادة	ت
4	1	2	3	CSCL1101	Structured Programming I	البرمجة المهيكلة1	1
2	1	-	2	CSCL1103	Mathematics I	الرياضيات1	2
2	1	-	2	CSCL1105	Discrete Structures I	الهياكل المتقطعة 1	3
2	1	-	2	CSCL1107	Computer Organization	تركيب الحاسوب	4
2	1	-	2	CSCL1109	Introduction to Statistics	مدخل الى الاحصاء	5
2	1	-	2	CSAI1101	Introduction to A.I	مقدمة الى الذكاء الاصطناعي	6
1	-	-	2	CSCL1111	English Language 1	اللغة الانكليزية 1	7
15	6	2	15		Total		

Total No. of Unit for 1st Semester: **(15)**Units — مجموعة الوحدات للفصل الدراسي الاول: (15) وحدة

Second Course

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	رمز المادة Subject Code	Subject	اسم المادة	ت
4	1	2	3	CSCL1202	Structured Programming II	البرمجة المهيكلة2	1
2	1	-	2	CSCL1204	Mathematics II	الرياضيات 2	2
2	1	-	2	CSCL1206	Discrete Structures II	الهياكل المتقطعة 2	3
3	1	2	2	CSCL1208	Logic Design	التصميم المنطقي	4
2	1	-	2	CSCL1210	Probabilistic Theory	نظرية الاحتمالات	5
3	1	2	2	CSAI1202	Prolog Language	لغة برولوك	6
2	1	-	2	CSAI1203	Knowledge Representation	تمثيل المعرفة	7
18	7	6	15		Total		

Total No. of Unit for 2nd Semester: **(18)**Units — مجموعة الوحدات للفصل الدراسي الثاني: (18) وحدة

Total No. of Unit for Year: **(33)** Units — مجموعة الوحدات لسنة دراسية: (**33**) وحدة

مجموع الوحدات التخصصية: 7

University of Technology
Computer Sciences Department
Artificial Intelligence Branch

1. Structured Programming (*with C++ Programming Language*) 1'st course

- Introduction, Procedural Programming Principles.
- Algorithm, Algorithm properties, Examples.
- Flowcharts, Flowchart Figure, Examples.
- C++ Language Basics
- Getting Started with C++
    - Character set and Identifiers
    - Variables and Variables Declaration
    - Constants Types
    - Arithmetic Operations
    - Assignment Operators
    - Relational Operators
    - Logical Operators
    - Bitwise Operator.
- The compiler directives (define and include).
- Unary Minus, Increment and /decrement Operators.
- Selection Statements
    - The Single If Statement Structure, The If/else Statement Structure, Nested If and If/else Statements
    - The Switch Selection Statement and Conditional Statement.
    - Break and Continue Control Statements
- Iteration Statements
    - While Repetition Structure
    - Do/While Statement.
    - For Statement and Nested Loops

2. Advanced Structured Programming (*with C++ Prog.Lang.*) - 2'nd course

- Functions
    - Defining a function
    - Return statement
    - Types of functions
    - Actual and formal arguments
    - Local and global variables
    - Parameters passing
    - Recursive functions.
- Arrays
    - One dimensional array (declaration, initialization, Accessing)
    - Two dimensional array (declaration, initialization, Accessing).
- String manipulation
- Structures
    - Type of Structure declaration
    - Array of Structures

- structure within structure
- functions and structures

- Pointers
  - pointers declaration
  - pointers and functions parameters passing
  - pointers and arrays
  - arrays of pointers
  - pointers to pointers

References:

1- Mastring C++, Amman-Jordan, AL-Shorok, 2002.
2- OqeiliSalch, prof. Department of IT-AL-Balqa Applied University.

3. Mathematics I – 1'st course

- Mathematical background
- Matrix
  - Types of matrix
  - Matrix addition, subtraction, and multiplication
  - Determinant, transpose, symmetric of matrix and rank of matrix
  - Inverse of matrix, absolute value, and polynomials
  - Grammar rule for solving system of equation.
- Functions
  - Function Definition
  - Domain and range of functions
  - Graphing of function
- Limits
  - Definition of limits
  - Theorems of limits
  - Type of limits
  - One side and two sides limits
  - Limits as infinity
  - Sandwich theorem and continues functions
- Derivation
  - Mathematical definition of derivation, rule of derivation
  - Derivation of trigonometric, inverse trigonometric, logarithm, exponential hyperbolic, inverse of hyperbolic function.
  - Implicit derivation, chain rule, higher derivation

4. Mathematics II – 2'nd course

- Derivation
  - L'hopital rule
  - Application of derivation, velocity and acceleration
- Series
- Integration

- Indefinite integral
- Rules of integral
- Method of integration
- Multiple integral
- Definite integral
- Application of integral area under the curve
- Area between two curves

References:

1- Thomas, G. Calculus and Analytic Geometry, 5th Edition, Addison Wesly, 1999.

5. Discrete Structures - 1'st course

- Set theory
  - Sets and subsets
  - How to specify sets, Operations on sets
  - Algebra of sets and its proves
  - Power set, Classes of sets, Cardinality
  - Sets of numbers, Finite sets and counting principle
- Mathematical induction
- Relations
  - Computer representation of relations and Digraph
  - Manipulation of relations, Properties of relations
  - Composition of relations
- Functions
  - Type of function (one-to-one & invertible function)
  - Geometrical characterization of functions
  - Sequences of sets, Recursively defined functions
- Logic and propositions
  - Basic logical operation, Equivalency
  - Tautology and Contradiction
  - Conditional and biconditional statements
  - Argument with examples

6. Advanced Discrete Structures - 2'st course

- Graphs
  - Definition, Graphs. Sub graph, and multigraphs
  - Degree of graph, Connectivity, Special graph
  - Walk & length of walk, Trail, path, cycle
  - The bridges of Konigsberg
  - Traversable multigraphs, Labeled graphs
  - Minimal path, Minimum spanning tree
  - Matrices and graph

- Trees, rooted tree, ordered rooted tree
- polish notation, with examples

➢ Finite state machines
- Finite automata
- Optimistic approach to construct FSM
- Deterministic Finite state automata

References:

1. Discrete mathematics by Seymour Lipchitz
2. Discrete mathematical structures for computer science by Bernard Kolman and Robert C. Busby

7. Computer Organization – 1'st course

➢ Introduction to computer architecture
➢ Computer definition, History of computer
➢ Application with computer system
➢ Computer classification [analog, digital, hybrid]
➢ Main parts of a personal computer
➢ Hardware: the structure of computer system
- Input units, Output units
- Central processing units [CPU] , CPU components [ALU,RS,CU], CPU operations
- Main memory, Primary storage, Type of main memory [RAM,ROM]
- Instruction format with memory
- Secondary storage , Type of secondary storage

➢ Software Programs and application programs andutilities
➢ System software and operating system and utilities
➢ Application packages.

References :

1. Computer System Architecture, M. Morris Mano, Third Edition, 1993.

8. Logic Design - 2'nd course

➢ Number system
- Decimal.
- Binary.
- Octal.
- Hexadecimal.

➢ Addition and subtraction
- binary
- octal
- Hexadecimal.

➢ Logic gats.

- Boolean algebra and simplification and demerger's.
- K-map.
- Combinational universal NAND and NOR logic.
  - Half-adder, full-adder, 4- bit parallel adder, and Subtract adder.
- Decoder, encoder, multiplexer, and demultiplexer.
- Sequential logic circuits and Flip-flop, SR, D, and JK flip-flop.
- Shift register 3-bit and 4- bit.
- Binary counter 3-bit and 4- bit.
- State diagram FSA, ROM and RAM.

References:

1. Computer System Architecture M.Morris Mano
2. Digital fundamentals by Floyd, 2009
3. Fundamental of digital logic and Microcomputer design, fifth addition.

9. Introduction to Statistics – 1'st course

- Basic concepts
  - Statistics
  - branches of statistics
  - population
  - samples , type of samples
- Random variables
  - discrete variable
  - continuous variable
- Data Organization
  - frequency distribution
  - proportionate frequency distribution
  - cumulative frequency distribution
  - histogram
- measurement of central tendency
  - mean
  - median
  - mode
  - Quadratic mean
- measurements of variation
  - standard deviation
  - variance
  - coefficient of variation
- Linear Correlation
  - Covariance
  - Simple correlation coefficient
  - Partial correlation coefficient
- Chi- square distribution

- test of independency
- test of goodness of fit

References:

1. Statistics: theories and applications, Joseph Inungo, 2006.
2. Introductory Statistics , Ronald J. Wonnacott
3. الأحصاء د. محمود حسن المشهداني

10. Probability Theory – 2'nd course

- Probability theory
  - basic concepts
  - sample space
  - events
  - rules of probability
  - Venn Diagram
  - tree diagram
- probability theorems
  - Addition theorem
  - Multiplication theorem
- Counting techniques
  - Factorial
  - Permutations
  - Combinations
  - Binomial theorem
- Conditional probability
- Bayes theorem
- Independent of events
- Discrete Probability distributions
  - Binomial distribution
  - Multinomial distribution
  - Poisson distribution
- Continuous Probability Distributions
  - Uniform distribution
  - Normal distribution
  - Exponential distribution

References:

1. Probability and statistics, theory and applications, Gunnar Blom
2. Probability and statistics for engineers, Richard L. Scheaffer

11. Introduction to Artificial Intelligence – 1'st course

- An Introduction to A.I
- AI Applications
- AI Brunches
- Prepositional calculus
- Predicate logic
- Knowledge representation
  - •Semantic Net
  - •conceptual Graph
  - • frames

- State Space problems
  - •Monkey &Banana Problem
  - •Jug Problem
  - •Rings Problem

References:

1. Max Bramer, " Logic Programming with Prolog ", Spring ,2005.
2.زينب الزرقاء وايمن عودة ، الذكاء الصنعي في لغة prolog شعاع للنشر والعلوم ، سورية ، حلب ، 3225.
3.الدكتور ف .سكر الذكاء الاصطناعي من خلال لغة prolog شعاع للنشر والعلوم ، سورية ، حلب ، 1991.

12. Prolog language – 2'nd course

- An Introduction to prolog Language
  Facts & Simple Rules
- Complex rules
- built in functions in prolog Language
- loop in Prolog
- Recursive technique
  - •Tail Recursive in prolog,
  - •Repeat function
  - •Findall function
  - •Cut & Fail Function
  - •Non Tail Recursive,
- List processing in prolog Language,
- String Processing in prolog Language
- Database manipulation predicates
- Files manipulation predicates

References

1. Luger E.George,"Artificial Intelligence Structures and Strategies ", 2005.
2. Elin Rich, "Artificial Intelligence",1991.
3. Matt Carter , "Mind and Computers, An Introduction to the Philosophy of Artificial Intelligence " , Edinbwgh University press , 2007.
4. Max Bramer, " Logic Programming with Prolog ", Spring ,2005.

13. English Language – 1'st course

- **Writing and Reading :-**
  - Parts of Speech (Noun, verb, adjective, adverb, etc)
  - Structure and kinds of sentence
  - Tenses in English
  - Active and passive voice
  - Prepositions of time and place
  - How to write and understand simple paragraphs on arrange of topics within the field of the study and interest or experience
  - Develop the extensive intensive reading skills by taking different passage
  - Write your CV in summary form
  - Expose to important technical vocabulary and Idioms
  - Write scientific papers and well-structured and
- **Project Implementation**
  - Choose a topic and apply the items of scientific writing.
  - Make presentation by applying the rules of the four skills of the language.

14. Knowledge Representation-2nd course

- Knowledge representation
  - •The Propositional logic
  - •The Predicate logic
  - •Clauses Form
- Resolution
  - •Backward resolution
  - •Forward resolution
- Script
- Production system
  - •Production rule
  - •Forward chaining
  - •Backward chaining
- Petri Nets
  - •Graphical petri net
  - •Mathematical petri net
- Monotonic & Non-Monotonic
  - •Default logic

References

2- Knowledge Representation and Reasoning. Ronald Brachman and Hector Levesque. The Morgan Kaufmann Series in Artificial Intelligence, 2004.
3- First Order Logic and Automated Theorem Proving. Melvin Fitting. Texts in Computer Science. 1995.

4- Handbook of Knowledge Representation. Frank van Harmelen, Vladimir Lifschitz and Bruce Porter (Eds). Foundations of Artificial Intelligence, 2008.

University of Technology
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Second Year Syllabus
First course

منهج المرحلة الثانية

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	رمز المادة Subject Code	Subject	اسم المادة	ت
3	1	2	2	CSCL2112	Object Oriented Programming I	برمجة شيئية 1	1
3	1	2	2	CSCL2114	Data Structures	هياكل بيانات	2
2	1	-	2	CSCL2116	Mathematics III	رياضيات 3	3
3	1	2	2	CSCL2118	Database Foundation	اساسيات قواعد البيانات	4
3	1	2	2	CSAI2104	NLP and Python Language	معالجة لغات طبيعية ولغة بايثون	5
1	-	-	1	CSCL2122	English Language II	لغة انكليزية 2	6
1	-	-	2	CSCL2120	Human Rights	حقوق انسان	7
16	5	8	13		Total		

Total No. of Unit for One Semester: **(16)**Units

مجموعة الوحدات للفصل الدراسي الواحد: (16) وحدة

Second Course

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	رمز المادة Subject Code	Subject	اسم المادة	ت
3	1	2	2	CSCL2213	Object oriented programming II	برمجة شيئية 2	1
3	1	2	2	CSCL2215	Sorting and Searching Algorithms	خوارزميات البحث والترتيب	2
3	1	2	2	CSCL2217	Numerical Analysis	تحليل عددي	3
3	1	2	2	CSCL2219	DataBase Design	تصميم قواعد بيانات	4
2	1	-	2	CSAI2205	Fuzzy Logic	منطق مضبب	5
3	1	2	2	CSAI2206	Searching Strategies	استراتيجيات البحث	6
1	-	-	1	CSCL2221	Democracy	ديمقراطية	7
18	6	10	13		Total		

Total No. of Unit for One Semester: **(18)**Units

مجموعة الوحدات للفصل الدراسي الواحد: (18) وحدة

مجموع الوحدات التخصصية: 8

Total No. of Unit for Year: **(34)** Units

مجموعة الوحدات لسنة دراسية: **(34)** وحدة

University of Technology
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Artificial Intelligence Branch

1- Object Oriented Programming- 1'st course

- Overview for functions and parameter transmission
- inline functions and function overloading
- Overview for structure and array in C++,
- Overview of pointer and String in C++
- Introduction to OOP and its main features
- Defining a Simple Class with Inline Member Functions
- Constructors and destructors functions
- Friends functions, Friend class
- Default Arguments and Implicit Member Argument
- Constant Members and Scope Operator
- Member Initialization List, and Static members
- Member pointers and reference members
- Class object members and object arrays.

2- Advanced Object Oriented Programming -2'nd course

- Operator overloading
- Function Overloading
- Inheritance and derived classes
- Class hierarchy notation
- Multiple inheritance
- Function template definition and instantiation
- Class template definition and instantiation
- Class template members
- Virtual function definition, polymorphism
- Types of polymorphism.

References:

1. "Mastering C++", Prof. OqeiliSaleh and others, Dar Al-Shorok, Amman-Jordan, 2004.
2. "Object Oriented Programming Language with C++", BjarneStroustrup, Addison-Wesley Publication, 2003.

3- Data Structures and Algorithms -1'st course

- Introduction to Data Structures
- Types of data structure
- Memory representation for 1D and 2D arrays
- Linear list and Linear list types
- Stack

- Stack Operations
- Applications of stack

➢ Queue
- Queue Operations
- Applications of queue

➢ Circular Queue
- CQueue Operations
- Applications of CQueue

➢ Linked List
- Linked-Stack
- Linked-Queue
- Linked-CQueue

➢ Recursion

4- Sorting & Searching Algorithms -2'nd course

➢ Graph

➢ Trees
- Types of Tree
- Binary tree
- Binary tree scan
- Represent Regulars expression using trees
- Binary Search Tree

➢ Sorting Algorithm
- Bubble Sort
- Insertion Sort
- Quick Sort)

➢ Searching algorithm
- Sequential Search
- Binary Search

References:

1. Data structures and Algorithms with Object- Oriented design Patterns in C++ by: Bruno R. Preiss, B.A.Sc., M.A.Sc.Ph.D., P.Eng. Associate Professor, Department of electronic and computer engineering, university of waterloo.
2. Data Structures and algorithm analysis in C, By: Mark Allen Weiss.
3. Data Structures and algorithms in Java PDF file.
4. Data Structures using C and C++, Yedidyah language, Moshe J. augenstein, Aaeon M. Tenenbaum, Brooklyn College.

5- Mathematic III- 1'st course

1-Partial Derivative
Partial Derivative, of two variables
-Total Differential
2- Differential Equations (d.e)
First Order Differential Equations
1-Variable Separable
2-Homogeneous Differential Equation (h.d.e)
3-Exact Differential Equation
3.1- Integrating Factor
4- First – Order Linear Differential Equation
4.1-The Bernoulli Equation
Second – Order Differential Equation
1-Homogeneous-Second – Order (D. E) With Constant Coefficient
2-Non-Homogeneous-Second – Order (D. E) With Constant Coefficient
2.1-Method of Undetermined Coefficient
2.2- Variation of Parameter
3-Laplace Transformation (L. T)
Definition
Laplace Transformation of Some Function
Laplace Transformation of Differential
Properties of L. T
(1) Shifting
(2) L. T of Integrals:
(3) Multiplication by t^n
(4) Division by t
(5) Unit Step Function u_a (t).
5-Inverse Laplace Transformation
Some Properties of Inverse L. T
1-Partial Fraction
2-Application of Laplace Transformation
Linear (D. E) With Constant Coefficient

6- Numerical Analysis 2'nd course

1-Numerical Analysis
Solution of Non-Linear Equations.
1. Newton-Rap son Method for Approximating.
2. Lagrange Approximation.

Numerical Differentiation and Integration.
Approximate Integration.
Integration Equal Spaces.

3. The Trapezoidal Rule.
4. Simpson's Rule.
5. Simpson's (3/8) Rule.

2-Fourier series
Periodic Function
Definition
1.1-Fourier series of Even and Odd Function
1.2-Half-Range Series
1.3-Change of Interval
Partial Differential Equations-3
Definition
Solution of First Order Linear (P. D. E)
Méthode of Variable Séparable

a- Wave Equation
b- Heat Equation

4- Ordinary Differential Equation.
Numerical Differentiation.

1. Euler Method.
2. Modified Euler Method (Euler Trapezoidal Method).
3. Rung Kutta Method.
4. Rung- Kutta-Merson Method.

System of Linear Equation.

5. Cramer's Rule.
6. Solution of Linear Equations by using Inverse Matrices.
7. Gauss Elimination Method.
8. Gauss Siedle Methods.

Refrences:

1- Calculus and Analytic Geometry by Thomas.
2- Gerald C. F and Wheatley P. O. "Applied Numerical Analysis," Addison Wesley. 1999.

7- Database Foundation-1'st course

- Centralized database system
  - Introduction and the purpose of database
  - Comparing between a file processing system and DBMS
- Data Abstraction and file system disadvantage
- Entity relationship model
  - Entities and entity sets
  - Relationships and relationship set
  - Attributes and mapping

- Constraints and keys

- Relational model
  - Data representation in relational model (Tables, Records, and keys)
- Tables joining, Instant and schema
- Weak entity in ER model
- ER model and relational model examples
- Indexing
  - Primary indexing
  - Secondary indexing
  - Index update
  - Hash index

8- DataBase Design- 2nd course

- Database Administrator and database design process
- Data base cardinality
- Normalization
- System architecture
- Transaction
- Database security
  - Access control
  - Encryption
- Fundamental of relational algebra:
- Query processing

References:

1. Date C. J.,"An Introduction to Database Systems",2004
2. Abraham Silberschatz, Henry F.Korth, S. Subarshan, " Database System Concepts",2006
3. David M. Kroenke, "Database Concepts", 2005.

9- NLP & Python Language -1'st course

- BASIC python SYNTAX
- VARIABLE TYPES
- BASIC OPERATORS
- DECISION MAKING
- LOOPS
- NUMBERS
- STRINGS
- LISTS
- DICTIONARY

- FUNCTIONS
- MODULES
- FILES I/O
- NLP Concepts
- NLP stages

References:

1. tutorials point simply easy learning, " Python programming language" , copyrighted 2014.

10- Fuzzy Logic -2'nd course

- Fuzzy sets
- the operations of fuzzy sets
- fuzzy relations and compositions,
- fuzzy graph and relation, fuzzy number,
- fuzzy functions, probability and uncertainty,
- fuzzy logic, fuzzy inference,
- fuzzy control and fuzzy expert systems
- real applications

References:

1. First course on fuzzy theory and application ", Kwang H. Le , spring 2005.
2. Introduction to fuzzy logic , and fuzzy control system ,Gauanrony Chen, Trung Tat Pham,© 2001 by CRC press LLC..

11- English Language II – 2'nd course

- **Listening and Speaking :-** (by listening to a selected conversations on technical topics)
  - How to understand a conversion
  - How to avoid silence in conversion
  - Focus and study the pronunciation.
  - Deal with different situations academic and non academic.
  - Express ideas and give detailed accounts of experiences, and describing feelings.
  - Engage in extended conversation on most topics
  - Give opinions by providing relevant explanations, arguments and comments.
  - Give clear, detailed description of subjects within field of study or interest.
  - Vocabulary and phrases for making presentations
  - Give clearly developed presentations on subjects in the field of study.
- **Translation**
  - What is the translation , kinds and steps of translation

- Scientific translation nature and steps
- How to use a dictionary and machine translation.

References :

1. English for computer users By SantiagR.Esteras, Fourth Edition, Cambridge University Press, 2008.
2. English Grammar In Use By Raymond Murphy, Third Edition, Cambridge University Press, 2004.
3. English Grammar and Composition By Wren and Martin, Revised by N.O.PrasadaRao,S.Chand,, Company Ltd., New Delhi, 2007.
4. 4. Tim Berners-Lee Web Page,http://www.w3.org/People/Berners-Lee

12- Search Strategies -2nd course

- A.I. Goals (Problem Reduction and Guarantee of Solutions)
- Intelligent Search Strategies (Problem state space and search space ,Problem Solving for Salesman Problem)
- Blind Search
  - Depth First search
  - Breadth First search
- Heuristic Search (Informed Search)
  - Hill Climbing
  - Best-First – Search
  - A – Algorithm
  - A* - Algorithm
- Heuristic Search Examples
  - 8-puzzle Problem
- Adversarial Search in Game playing
  - Minimax Algorithm
  - Alpha – Beta Algorithm
  - Tic-Tac- Toe Problem
  - The and \ or Graph

References:

1. Elian Rich, “Artificial Intelligence”,1991.
2. Luger E.George,”Artificial Intelligence Structures and Strategies ”, 2008.
3. Stwart Russel and Peter Norvig , "Artificial Intelligent ,a Modern Approach" ,2003.
4. Amit Konar, " Artificial Intelligence and Soft Computing , Behavior and Cognitive Modeling of the Human Brain ", CRC press ,2000.

5. Dimitris Varkas and Ioannis Pl. Vlashavos, " Artificial Intelligence for Advanced Problem Solving Technique", published in the USA by Information science reference (an imprint of "IGI" Global),2008.

13- حقوق الانسان

- مفهوم الحقوق(تعريف الحقوق-خصائص الحقوق).
- حقوق الانسان في الشرائع السماوية(الديانتين المسيحية واليهودية- الدين الاسلامي).
- مصادر حقوق الانسان(المصادر الدولية- المصادر الوطنية).
- ضمانات حقوق الانسان(الضمانات على الصعيد الداخلي- الضمانات على الصعيد الدولي).
- التقدم التكنولوجي واثره على الحقوق والحريات(الاحزاب السياسية- حماية الملكية الفكرية).

المصادر

-1 بحث مختصر عن حقوق الانسان على الموقعwww.startime.com
1- حقوق الإنسان والطفل والديمقراطية د.ماهر صالح علاوي الجبوري،د. رعد ناجي الجدة،د رياض عزيز هادي، د.كامل عبد العنكود،د.علي عبد الرزاق محمد، د.حسان محمد شفيق
2- الاتجار بالبشر في القانون واحكام الشريعة الاسلامية - بحث مقدم من قبل م.م محمد احمد عيسى
3- الاتجار في البشر –اعداد هشام بشير/على الموقع
4- ما هو الحزب السياسي-على الموقع kenana online.com
5- د. عبد الحميد عثمان- الحماية القانونية للملكية الفكرية.
6- حقوق الملكية الفكرية كما يفهمها رئيسها- مقالة منشورة في جريدة الناس على الموقع /www.Alnaspaper.com
7- -تعريف الملكية الفكرية - على الموقع .gov.aewww.dubaicustom
8- زياد مرقة-الملكية الفكرية والعصر الرقمي

14- الديمقراطية

- مفهوم الديمقراطية(تعريف الديمقراطية- مزايا الديمقراطية).
- اشكال الديمقراطية(الديمقراطية المباشرة- الديمقراطية شبه المباشرة-الديمقراطية النيابية-المجلس النيابي).
- الية النظام النيابي-الانتخاب-(مفهوم الانتخاب-هيئة الناخبين-تنظيم عملية الانتخاب-نظم الانتخاب).

المصادر

a. حقوق الإنسان والطفل والديمقراطية د.ماهر صالح علاوي الجبوري،د. رعد ناجي الجدة،د رياض عزيز هادي، د.كامل عبد العنكود،د.علي عبد الرزاق محمد، د.حسان محمد شفيق
b. محاضرات في الديمقراطية- د فيصل شطناوي

University of Technology
Computer Sciences Department
Artificial Intelligence Branch

منهج المرحلة الثالثة

Third Year Syllabus

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	رمز المادة Subject Code	Subject	اسم المادة	ت
3	1	2	2	Cs20	Computer Graphics	رسوم الحاسوب	1
3	1	2	2	Cs21	Compilers	المترجمات	2
3	1	2	2	Cs34	Databases	قواعد بيانات	3
3	1	2	2	Cs19	Computer Architecture And micro-processors	معمارية الحاسوب والمعالجات المايكروية	4
3	1	2	2	Cs46	Natural Language Processing	معالجة اللغة الطبيعية	5
3	1	2	2	Cs45	Expert Systems	النظم الخبيرة	6
3	1	2	2	Cs47	Machine learning	تعلم الماكنة	7
2	1	-	2	Cs17	Operations Researches	بحوث عمليات	8
23	8	14	16		Total		

Total No. of Unit for One Semester: **(23)**Units
مجموعة الوحدات للفصل الدراسي الواحد: (23) وحدة

Total No. of Unit for Year: **(46)** Units
مجموعة الوحدات لسنة دراسية: (46) وحدة

1- Computer Graphics:

- Introduction { Computer Graphics, Cathode Ray Tube (CRT) , **Generating color on a RGB monitors**, Coordinates system, **Raster–can display**, Frame Buffer, **Scan conversion, Applications of computer graphics** }
- **Vectors {unit vector, measurement associated with vectors, manipulation vectors, negative vectors and subtracting vectors, scaling Vectors, multiplying vectors uses the "dot Product" & direction Cosine,"cross product" }**
- Basic Shapes Drawing (Line, Circle, **Ellipse**)
- Two Dimension Transformations(Translation, Scaling, Rotation, Reflection, **shearing**)
- Clipping and Windowing and **viewport and polygon**
- Three Dimension Transformations (Translation , Scaling, Rotation, Reflection[mirror 3D])
- Vector 3D all properties
- Projection (Orthographic Projection, Perspective Projection, **Oblique projection**)
- Curves **Spline {Bezier Curve ,B-Spline Curve, Cubic Curve }**
- **3D Shapes {Hellix, Sphere}**

References:

*"Computer Graphics Mathematical first steps", P.A. Egerton & W.S Hall ,university of Teesside, 1999.

*"Theory & Problems of Computer Graphics", ZHIGANG XIANG, ROY A. PLASTOCK, Schaum,s outline series 2000.
*Lengyel .E, "Mathematics for 3D Gage Programming and Computer Graphics", Charles River Medal. Inc 2004.
*Soloman, D. "Curves & Surface for Computer Graphics", Springer Science Media. Inc. 2006

2- Compilers:

Programming Language, Introduction to Compiler, Type of Errors, One Pass Compiler, Syntax Definition, Context Free Grammar, Parsing Tree & leftmost and rightmost derivations, Transition Graph, Lexical analysis, Syntax of Analysis, Problems of Compiler, First and Follow, Top down Parsing, Predictive Parsing Method, LL(1), Error Detection and Reporting, Bottom up Parsing, Operation Precedence Parser, Simple Left to Right Parser, Canonical LR Parser, Look Ahead LR, Semantic Analysis, Intermediate Code Generation, Code Optimization, Examples of Code Optimization, Code Generation.

References: Principles of Compiler Design ,Alfred V. Aho, Jeffry D. Ulman 2003.

3- Databases :

What is database (Introduction, purpose of database , DBMS , differences between a file processing system and DBMS and file system disadvantage) . Database abstraction, database models (Hierarchical and Network model). Entity relationship model (ER-Model) :entity and entity set, attributes, relationship and relationship set, mapping constraints, week entities and keys). Relational model : Tables, Records , Fields , Keys and tables joining . Database administrator and database design : Schema . Indexing : primary and secondary index , index update , hash index . Normalization . System architecture : centralized and distributed database. Transaction processing. Database security : access control and encryption.

References

1. Database system concepts,Abraham sillberchatsz & Henry F. Korth,6th Edition.

4- Computer Architecture:

Introduction to computer architecture and CPU architecture, Instruction set and format, Addressing modes, Program control (interrupt and subroutine call), Microprogramming Design of CPU Control Unit and Micro programmed vs., ardwired Control, RISC and CISC, I/O organization and Peripheral Control Strategies, Input / output interfaces, Asynchronous data transfer, Programmed I/O, Memory Management, types and hierarchy, Main memory and memory address map, Direct Memory Access, Input / output processor (IOP) and Channels, Associative Memory and Content-Addressable Memories, Cache memory, Parallel processing, Pipeline (general consideration), Arithmetic pipeline, Instruction pipeline, Difficulties

in Instruction pipeline, And theme solutions, Vector processing, And array processors, Interprocessor communication, Cache coherence.

References:

1- M.M Mano "Computer System Architecture " third Edition, Prentice Hall, 1993.
2- David A. patterson And John L.Hennessy, "Computer Organization And Design " Morgan Kaufmann, 1998.

5- Natural Language Processing (NLP):

Introduction to NLP: (Definition of NLP, NLP Goal, The advantage of NLP, Example of Intelligent Robot), Understanding: (What is Understanding?, What makes understanding hard?, The complexity of the target representation, Type of mapping, Level of interactive among components), Types of Languages & Grammars: (Type 0: Phrase Structure Grammar (PSG), Type 1: Context Sensitive Grammar (CSG), Type 2: Context Free Grammar (CFG), Type 3: The Dictionary & the Morphology,
Regular Grammar (RG), Written Text Processing (Formal Method), Lexical analysis, Syntax analysis: (Rules of Grammar, Parse Tree and Transition Network Parser), Semantic analysis, Syntax Analysis (Formal Method): Rules of English Grammar, Example of PROLOG program of English Grammar solved in: Append Mechanism.Syntax Analysis, Formal Method, Append Mechanism with Singular & Plural Consideration. Syntax Analysis (Formal Method): Difference Pair Idea, Semantic Analysis (Formal Method): Augmented Transition Network (ATN).
Analyzing the semantic structure of a sentence: (object case, Agent case, Co-agent case, Beneficiary case, Location case, Time case, Instrument case, Source and destination cases …), C: The Case Analysis Parser. Written Text Processing (Informal Method), Extracting meaning from keywords, Example of PROLOG program (DOCSYS) for a manual of a company. Machine Translation (MT): (Definition of MT and its usage, Computer-Aided Human Translation (CAHT), Language Similarities & Differences), Machine Translation Methods: (Direct Translation Method, Transfer Method, The Interlingua Idea: Using Meaning), Spoken language Processing: (Speech definition, Problem areas in speech recognition system, Text-Dependent & text Independent SR, Continuous & Isolated SR), SR System model, From talk to text: Hidden Markov Model (HMM), Application on SR system, Text to Speech(TTS) Model, The relationship between NL & SR: Compares between Written text processing & Speech processing.

References:

1. Elian Rich, "Artificial Intelligence",1989.
2. William A. Stubblefield & Luger E.George,"Artificial Intelligence and the Design of Expert Systems", 1998.
3. Daniel Jurafsky and James H. Martin "Speech and language processing : Introduction to natural language processing , computational linguistics and speech recognition" second edition 2006.
4. Daniel H. Marcellus " Artificial Intelligence and the design of expert systems" 1998.

6- Expert Systems

- Introduction to Expert Systems
- Structures of Expert Systems
- General architecture of Expert Systems
- The Pattern Matching system
- Systems Based on Simple Search and Pattern Recognition
- Search with Heuristic Embedded in Rules 1
- Using Heuristics in Games
- Using Heuristics in Games with Minmax and Alpha-Beta
- Controlling the Reasoning strategy
- Classification vs. Recognition
- Classification System using backward Chaining
- Classification System using Forward Chaining
- Production Rules and Production Systems
- Diagnosis System using Forward Chaining
- Diagnosis System using Backward Chaining
- Systems that Work under Uncertainty Factor 1
- Systems that Work under Uncertainty Factor 2
- Systems that explain their actions
- Explanation Mechanism
- HOW Facility
- WHY Facility
- Shell Facility
- Search with Heuristic Embedded in Rules 2
- Knowledge Discovery, Acquisition and Engineering
- General Intelligent System Architecture
-

References:

1- Daniel H. Marcellus, Expert Systems Programming in Turbo Prolog, Prentice Hall (New Jersey) 1992.
2- George F. Luger,Artificial Intelligence (structures and strategies for complex problem solving), 2005.
3- Daniel Borrajo , " Current Topics in Artificial Intelligence ", Springer ,2007.
4- Joseph C. Giarratano and Gray D. Riley, "Expert systems, principles and programming ", Thomson, 2005.
5- Computational Intelligent by Andries P. Engelbrecht
6- Metaheuristic by Talibi Elghazali, 2006.
7- Clever Algorithms by Bronili K., 2010.

7- Machine Learning

Introduction (Definition of learning system, Goals and Application of machine learning, Aspect of developing a learning system: training data, concept representation, function approximation), Inductive classification- The concept learning talk(Concept learning as search through a hypothesis space, General – to –

specific ordering of hypothesis, Finding maximally specific hypothesis, Version space and the candidate elimination algorithm, Learning conjunctive concepts, The importance of inductive basis), Decision Tree Learning (Representing Concepts as decision tree (Recursive inductive of decision tree, Picking the best splitting attribute: entropy and information gain, Search for simple trees and computational complexity, Occam's razor, Over filtering, noising data, and pruning), Instance – Based – Learning (Constructing explicit generalization versus comparing the past specific example, K-Nearest- neighbor algorithm, Case – based learning), Neural Networks(Artificial neuron concepts, NN Architecture, Supervised &Unsupervised , Activation Functions, learning Rules, Hebbian Learning rule, Basic Delta Rule, ANN taxonomy, Hopfield NN, Back Propagation NN, BAM,- Adeline, Kohonen NN, (ART), Auto& Hetero Associative, Genetic Algorithms (GA concepts, GA Operators, GA Parameters, GA Fitness Function, Genetic Programming, GA Application.

References:

1- Fundamentals of Neural Networks: Architecture, Algorithms, and application. By Laurene Fausett
2- Neural Networks. By Phil Picton
3- Neural Networks. Fundamentals, Application, Examples. By Werner Kinnebrock
4- Neural network for identification, prediction and control. By D. T. Pham and X. Liu.
5- Genetic Algorithms. By Gross berg
6- Introduction to neural system. by- Zurada
7- Elian Rich, “Artificial Intelligence”,1989.
8- William A. Stubblefield & Luger E.George,”Artificial Intelligence and the Design of Expert Systems”, 1998.

8- Operations Researches:

Probability(The concept of probability,- Discrete probability distribution, Continuous probability distribution), Operation Research(- Operation Research Definition, Linear programming formulation,-Graphical solution, Simplex method, Duality and sensitivity analysis, Transportation model, Networking analysis, Games theory, Queuing Theory).

References:

1. Operation Research: An Introduction, Hamdy A. Taha.

Elective Subjects for Third Year **المواضيع الاختيارية للمرحله الثالثة**

No. of Units	Tutorial	No. of Lab.	No. Of Theory	Subject	اسم المادة	ت

		hour	**hour**			
3	**1**	**2**	**2**	**Moulding and Simulation**	النمذجة والمحاكاة	**1**
2	**1**	**-**	**2**	**Predicted and Decision Making**	التنبؤ واتخاذ القرار	**2**

University of Technology
Computer Sciences Department
Artificial Intelligence Branch

Forth Year Syllabus

منهج المرحلة الرابعة

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	رمز المادة Subject Code	Subject	اسم المادة	ت
3	1	2	2	CS49	Planning & Robotics	التخطيط والإنسان الآلي	1
3	1	2	2	CS48	Communications and Computer Networks	الاتصالات وشبكات الحاسوب	2
2	1	-	2	Cs27	Computer and Data Security	امنية الحاسوب والبيانات (أختياري)	3
3	1	2	2	Cs26	Operating Systems	نظم التشغيل	4
2	1	-	2	Cs50	Data Warehouse & Data Mining	مخازن وتنقيب البيانات	5
3	1	2	2	Cs24	Web programming	برمجة مواقع الانترنت (أختياري)	6
3	-	2	2	Cs51	Machine Vision	الرؤيا بالماكنة	7
3	-	4	1	Cs82	Project	مشروع	8
22	6	14	15		Total		

Total No. of Unit for One Semester: **(22)**Units
مجموعة الوحدات للفصل الدراسي الواحد: (22) وحدة

Total No. of Unit for Year: **(44)** Units
مجموعة الوحدات لسنة دراسية: (44) وحدة

1- Planning & Robotics:

Planning and Navigation(path planning, Planning with if-Add Delete Operators, Least commitment planning, Hierarchical task network planning), Motion Planning(Basic concepts, robot? What Robot?, Space objects,- Input Information sensing, Egress of freedom. Coordinate systems,- Motion control, Robot programming, Motion Planning), Major Issues in Robotics(Kinematics, Static, Feedback Control, Complaint Motion,- Trajectory modification,- Collision Avoidance,- Motion Planning with Complete information, Motion planning with incomplete information), Motion Planning for a Mobile Robot , Basic methods, from a point robot to a physical robot , Which algorithm to choose), Motion planning for Two –Dimensional arm manipulator

References:

1- 'Robot Motion Planning and Control', J.-P. Laumond (Ed.),Springer-Verlag London Limited 1998 .
2- 'Introduction to Autonomous Mobile Robots Intelligent Robotics and Autonomous Agents ', Siegwart, Roland.; Nourbakhsh, Illah Reza ,MIT Press ,2004.
3- Elin Rich, “Artificial Intelligence”,1991.
4. Luger E.George,”Artificial Intelligence structure and strategies”, 2005.

2- Communications and Computer Networks

Data Communication, Physical Topology, Basic Network Technology, LAN Devices, Collision and Collision Domains in Shared Layer Environments, Network Devices,

Network Layer Addressing, Network Layer Field & Datagram, IP address Class, Subnet NW, Private Addresses, Transmission of Digital Data Interfaces and Modems, Transmission Media, Unguided Media, Satellite Communication, Error Detection and Correction, Data Link Control, Multiplexing, De Multiplexing, Data Link Protocols, ARP, FTP, TELNET, DNS, UDP, TCP, NFS and RPC, SMTP, TFTP, HTTP, WAIS, Gopher, SNMP, WWW, Browser Architecture, Methods for Assigning IP Address, Advance ARP, DHCP, Dynamic Addressing, Routable and non Routable Protocols, RIP Features.

References:

1- "Computer Networks", 3rd Edition, A. Tannenbaum, Prentice-Hall, 1996.
2- "Data Communications, Computer Networks and OSI", 4th Edition, F. Halsall, Addison-Wesley, 1995.
3- "Computer Communications and Networks", J. R. Freer, USL Press, 1996.

3- Computer and Data Security:

Security, Confidentiality, Threats to confidentiality, Integrity, Availability, Authentication, Non-repudiation, Security Attack, Basic Terminology, Basic Cryptographic Algorithms Cryptographic Random Number Generators, Strength of Cryptographic Algorithms, Cryptanalysis and Attacks on Cryptosystems Information hiding (steganography and water marking(Mathematical Background, Prime Numbers , Greatest Common Divisor(GCD), (LCM) Least Common Multiple, Modular, Euler Function, Inverse Algorithm (inv), Fast Exponential.

Classical Encryption, Transposition Ciphers, Keyless Transposition Ciphers, Keyed Transposition Ciphers, Combining Two Approaches, Double Transposition Ciphers, Monoalphabetic Ciphers, Additive Cipher , Shift Cipher and Caesar Cipher, Multiplicative Ciphers , Affine Ciphers , polybious cipher Polyalphabetic Ciphers, Autokey Cipher, Vigenere Cipher, Beaufort Cipher , Running Key Cipher Polygraphic Ciphers, Playfair Cipher, Hill Cipher, Other Ciphers and Codes, Ascci Beale Cipher, Book Cipher ,

Data Encryption Standardx)DES), , Block Cipher, ECB Operation Mode , CBC Operation Mode , Output Feedback Mode (OFM), Product Cipher , Iterated Block Cipher , Feistel Cipher, DES Cipher , Data Encryption Standard (DES), DES (Data Encryption Standard) history, Description of DES, Outline of the Algorithm, The Initial Permutation, The Key Transformation, The Expansion Permutatio, The S-Box Substitution , The P-Box Permutation, The Final Permutation, Decrypting DES.

Exponential Cipher, Introduction, Public-Key Cryptography, Public-Key Applications, Security of Public Key Schemes Exponentiation Ciphers, Pohlig-Hellman Scheme, RSA description and algorithm, Key Generation Algorithm, Encryption, Decryption, A simple example of RSA encryption, Security Concern Secrecy And Authenticity Merkle-Hellman Knapsacks, MH Knapsack, Diffie-Hellman knapsack Stream Cipher, One-Time Pad or Vernam Cipher, Drawback, Solution , Randomness , Pseudo-randomness , Synchronous Stream Ciphers , Self-Synchronizing Stream Ciphers, Linear feedback shift registers, Nonlinear combination , Generators Nonlinear Filter Generator , Example (Geffe Generator,(Randomness key tests.

References:

1- Managing Cisco Network Security: Building Rock-Solid Networks,2000
2- William Stallings, *Cryptography and Network Security, (Principles and Practice),* 2003

William Stallings, *Cryptography and Network Security, (Principles and Practice),* 2011

4-**Operating System:**

Operating system overview, Operating system History and types:- Main frame systems, Desktop systems, Multiprocessor systems, Distributed systems, Clustered systems, Real time systems, Handheld systems, Hardware protection, operating system structure, operating system components, operating system services, processes, process concepts, cooperating process, threads, CPU scheduling(concepts, Scheduling Criteria, Scheduling Algorithms, First Come First Served and Shortest Job First, Priority Scheduling algorithm and Round Robin Algorithm, Multi level queue scheduling, multiprocessor scheduling, real time scheduling, Deadlock, Introduction to Deadlocks handling, threads, Introduction to process synchronization, Memory Management, Storage management.

References

"Operating System Concepts" by Silberschatz, Galvin and Gagne, 2010.

5- Data Warehouse & Data Mining

History of Data, History of data warehousing, Data warehouse Concepts, Granularity, The Benefits of Granularity, Data of Data Warehouse, Data Warehouse Definition, Subject Orientation, Data Integration, Non-volatility, Time Variant, Reasons for building Data warehouse, General Reasons, Design of data warehouses, Data warehouse Constructions, Data Acquisition/Collection, Metadata, Metadata types, Data mart, Trustworthiness/Security, Data Warehouse Architecture, Architecture components, Type of Architecture, Structuring Data in the Data Warehouse, Data Homogeneity and Heterogeneity, Types of Distributed Data Warehouses, Data Warehouse and the Web, Detecting Intrusions by Data Mining, Distributed Data Warehouse, Reduction in costs of Data warehouse, Unstructured Data and the Data Warehouse, The Data Warehouse and the ODS, Data Mining philosophy, What motivated to Data Mining, Why is data mining important?, Why data mining now?, Why is data mining Necessary?, Data Mining Definition, Alternative names of DM, Data Mining Objectives, Data Mining Application, Advantages of Data Mining, Disadvantages of data mining, Data Mining Techniques, Data Mining: On What Kind of Data? General Data Mining Functionalities, Data Mining Activities or tasks, Trends that Effect Data Mining, Data Mining Algorithms, Database Vis Data Mining, Data Mining Process, KDD Process, Data Mining Development, Overview of association rules algorithms, Classification based on Association rules, Mining Association rules with Multiple Min-supports, Cyclic Association Rules, FP-growth method, Some areas which are related to data mining, Cube view of Data, Data cub technology, OLAM and OLAP architecture, Classification by decision tree, Multidimensional data model,

Mining multimedia database, Mining the World Wide Web, Visual and audio data mining, Detecting Intrusions by Data Mining.

References

1. W. H. Inmon**"Building the Data Warehouse",** Fourth Edition. Published by Wiley Publishing, Inc**,** Indianapolis, Indiana, 2005
2. Bhansali, Neera. **"Strategic Data Warehousing: Achieving Alignment with Business"**. CRC Press. United States of America. 2010.
3. Wang, John. **"Encyclopedia of Data Warehousing and Mining"**. Second Edition. Published by Information Science Reference. United States of America. 2009.
4. Prabhu, S., and N. Venkatesan. **"Data Mining and Warehousing"**. Published by New Age International (P) Ltd., Publishers. 2007.

6- Web Programming :

Introduction to Web, Introduction to the Internet, The World Wide Web, The Internet and Web, The History and Growth of the Web, The Purpose of the Web, The Web Concepts, The Web Site Generations, Classifying the Web Sites, Programming Technologies, ASP Principles, Web Programming with ASP ,Web based Applications.

References:

1. World Wide Web Consortium (W3C) ,http://www.w3c.org
2. Tim Berners-Lee Web Page,http://www.w3.org/People/Berners-Lee
3. Weaving the Web … "Book" ,http://www.w3.org/ People/Berners-Lee/Weaving/Overview.html
4. Web Site Engineering, http://www.geocities.com/website_engineering/chapter01.htm

7- Machine Vision

Image Acquisition (Image representation, Image Processing, Image Analysis, Image Classification), Machine Vision Techniques (Elementary Image processing Functions, Monadic Point – by – point operators, Intensity histogram, Look-up-table (LUT), Dyadic, point- by – point ,Local operator (Neighborhood operation), Linear local operator, non-linear local operator, Edge Detections, N- tuple operators (templates), Gray Scale Corner Detection, Segmentation, Non-contextual technique –thredsholding, Contextual technique, Pixel Connectivity, Region Similarity, Region growing, The split and merge algorithm), Mathematical Morphology (Dilation and Erosion, Opening and Closing, Skeletonisation), Pattern Recognition (Pattern Recognition System Design, Feature Selection, Boolean Operators, Binary object features (object measurements), Size management,- Shape measurement, Location measurement, Pattern Classification, Template matching, Distance measure, Similarity measures, Optical character Recognition (OCR),Content Based Image Retrieval (CBIR)

References:

a. machin vision : theory, algorithms, practicalities, E. R. davies, 2004.
b. computer imaging : Digital image analysis and processing, Scott E. Umbauugh, 2005.
3. Algorithms for image processing and computer vision, J. R. parker , 1996.

8- Project.

Description for Research Project

Research project is an study proposed by teacher (supervisor) and developed by student (fourth class only), this study aim to train the student on it is specialization of scientific (the scientific branch in computer sciences).

Time for Research Project

The Student given full academic year for accomplishes his study.

Exam for Research Project

Research project will be evaluated by a supervisor and Committee of Experts.

Format for Research Projects

Research projects are written up in standardized format. Be formal & objective in English language, & cite all sources. The format includes the following sections:

Title

Title would normally include the major variables of student study. For example:

"A protection system for an Internet site"

Abstract

Begin with a brief Abstract of the study, which summarizes the entire study into one paragraph. The reader should be able to tell from Abstract what theory and hypothesis were, who you studied and how, what your findings were, and what they meant for the theory.

Introduction

The introduction includes a brief (~2-3 page) review of current theory & research in the area of your topic. In presenting this material, paraphrase it into your own words, but always cite the source of the information. Referencing must be complete & correct, or you are plagiarizing, which is a serious academic offence. End with an introduction to your study, including your hypothesis.

Method

1. Materials/Instruments , Describe any instruments employed to measure the variables of your study. (e.g. questionnaires, tests, etc.)
2. Procedure , The Procedure section reviews exactly how you did your study, & should include enough detail that anyone could repeat your procedure. Include your methodology (e.g. whether you did an experiment, or observation, etc.); a review of how you carried out the study; & any data analysis that you did.

Results

Include your results, summarized & presented in a way that is easy to follow & to understand. If possible, these results should be presented both in a table (which would include descriptive & inferential statistics) & in a written description of the results. The results section should not include conclusions or interpretations; these would be in the Discussion section.

Discussion

Use the discussion to relate your results to the theory you described in the introduction. The "why" of your results are discussed here, & what they mean in terms of theory & research. Add a discussion of the limitations of your study.

References

All references in the introduction are included in the reference section at the end of the research report, in alphabetical order.

Appendix

Any information that is relevant to the study, but not needed within the body of the paper, should be included at the end of the report. These appendices would include further details of the research instructions, materials, results, psychological measures, etc., if needed. Your instructor may also wish you to attach the raw data of your project.

Elective Subjects for Forth Year **المواضيع الاختيارية للمرحله الرابعة**

No. of Units	Tutorial	No. of Lab. Hour	No. Of Theory hour	Subject	اسم المادة	ت
3	**1**	**2**	**2**	**Intelligent Databases**	قواعد البيانات الذكية	**1**
2	**1**	**-**	**2**	**Internet Architecture**	معمارية الانترنيت	**2**
3	**1**	**2**	**2**	**Advance Intelligent System**	الانظمة الذكية المتقدمة	**3**

University of Technology
Computer Sciences Department

Computer Security Branch

2018-2017

المناهج الدراسية لفرع الأمنية
للعام الدراسي 2018-2017

University of Technology
Computer Sciences Department
Computer Security Branch

2018-2017

First Year Syllabus

منهج المرحلة الاولى

المرحلة الاولى – الفصل الاول							
ت	رمز الدرس	عنوان الدرس	Subject	عدد الساعات في الاسبوع			
				النظري	العملي	المناقشة	الوحدات
1	CSCL1101	برمجة مهيكلة 1	Structured Programming I	3	2	1	4
2	CSCL1103	رياضيات 1	Mathematics I	2	-	1	2
3	CSCL1105	هياكل متقطعة 1	Discrete Structures I	2	-	-	2
4	CSCL1107	تركيب حاسوب	Computer Organization	2	-	1	2
5	CSCL1109	مقدمة الى الاحصاء	Introduction to Statistics	2	-	1	2
6	**CSCS1101**	**مبادىء أمنية البيانات**	Principles of Dara Security	**2**	**-**	**-**	**2**
7	**CSCL1111**	**لغة انكليزية 1**	English Language 1	**2**	**-**	**-**	**1**
Total				**15**	**2**	**4**	**15**

المرحلة الاولى – الفصل الثاني							
ت	رمز الدرس	عنوان الدرس	Subject	عدد الساعات في الاسبوع			
				النظري	العملي	المناقشة	الوحدات
1	CSCL1202	برمجة مهيكلة 2	Structured Programming II	3	2	1	4
2	CSCL1204	رياضيات 2	Mathematics II	2	-	1	2
3	CSCL1206	هياكل متقطعة 2	Discrete Structures II	2	-	-	2
4	CSCL1208	تصميم منطقي	Logic Design	2	2	1	3
5	CSCL1210	نظرية احتمالات	Probabilistic Theory	2	-	1	2
6	**CSCS1202**	**نظرية الارقام**	**Numbering Theory**	**2**	**-**	**-**	**2**
7	**CSCS1203**	**تقنيات الترميز**	**Coding Theory**	**2**	**-**	**-**	**2**
Total				**15**	**4**	**4**	**17**

Total No. of Unit for first Course: (15)Units

Total No. of Unit for Second Course: (17)Units

Total No. of Unit for Year: (32) Units

Total No. of Unit for Specialist Courses: (6)Units

University of Technology
Computer Sciences Department
Computer Security Branch

2018-2017

Second Year Syllabus

منهج المرحلة الثانيه

المرحلة الثانية – الفصل الاول							
ت	رمز الدرس	عنوان الدرس	Subject	عدد الساعات في الاسبوع			
				النظري	العملي	المناقشة	الوحدات
1	CSCL2112	برمجة شيئية 1	Object Oriented Programming 1	2	2	1	3
2	CSCL2114	هياكل بيانات	Data Structures	2	2	1	3
3	CSCL2116	رياضيات 3	Mathematics 3	2	2	1	3
4	CSCL2118	اساسيات قواعد البيانات	Database Foundation	2	2	1	3
5	CSCS2104	التشفير الانسيابي	Stream Cipher	2	2	1	3
6	CSCL2120	حقوق انسان	Human Rights	2	-	-	1
7	CSCL2122	لغة انكليزية 2	English Language 2	2	-	-	1
Total				14	10	5	17

المرحلة الثانية – الفصل الثاني							
ت	رمز الدرس	عنوان الدرس	Subject	عدد الساعات في الاسبوع			
				النظري	العملي	المناقشة	الوحدات
1	CSCL2213	برمجة شيئية 2	Object oriented programming2	2	2	1	3
2	CSCL2215	خوارزميات البحث والترتيب	Sorting and Searching Algorithms	2	2	1	3
3	CSCL2217	تحليل عددي	Numerical Analysis	2	2	1	3
4	CSCL2219	تصميم قواعد بيانات	DataBase Design	2	2	1	3
5	CSCS2205	أمنية تصميم البرمجيات	Secure Software Design	2	-	-	2
6	CSCS2206	أمن المعلومات والبيانات	Information &Data Security	2	-	-	2
7	CSCL2221	ديمقراطية	Democracy	2	-	-	1
Total				14	8	4	17

Total No. of Unit for first Course: (17)Units

Total No. of Unit for Second Course: (17)Units

Total No. of Unit for Year: (34) Units

Total No. of Unit for Specialist Courses: (7)Units

University of Technology
Computer Sciences Department

Computer Security Branch

2018-2017

Third Year Syllabus

منهج المرحلة الثالثة

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	Subject	اسم المادة	رمز الدرس	ت
3	-	2	2	Compilers	المترجمات	CS	1
3	1	2	2	Databases	قواعد البيانات	CS	2
3	1	2	2	Computer Architecture and microprocessor	معمارية الحاسبة و المعالجة المايكروية	CS	3
2	1	-	2	Secure software design	أمنية تصميم البرامجيات	CS	4
3	1	2	2	Artificial Intelligent	الذكاء الاصطناعي	CS	5
3	1	2	2	Block cipher Cryptography	التشفير الكتلي	CS	6
3	1	2	2	Computer Network s	شبكات الحاسوب	CS	7
3	1	2	2	multimedia	تعدد الوسائط	CS	8
23	7	14	16	Total			

Total No. of Unit for One Semester: **(23)**Units
Total No. of Unit for Year: **(46)** Units

مجموع الوحدات للفصل الدراسي الواحد: (23) وحدة
مجموع الوحدات لسنة دراسية: (46) وحدة

Forth Year Syllabus

منهج المرحلة الرابعة

No. of Units	Tutorial	No. of Lab. hour	No. Of Theory hour	Subject	اسم المادة	رمز الدرس	ت
3	1	2	2	Intelligent Systems	أنظمة ذكية	CS	1
2	1	-	2	Mobile and network Security	امنية الموبابيل والشبكات	CS	2
2	1	-	2	Cryptanalysis	تحليل شفرة	CS	3
3	1	2	2	Secure Operating System	نظم التشغيل الآمنية	CS	4
2	1	-	2	Advance Cryptography	تشفير متقدم	CS	5
3	1	2	2	Web Programming	برمجة مواقع	CS	6
2	1	-	2	Information Hiding	أخفاء المعلومات	CS	7
3	-	4	1	Project	المشروع	CS	8
20	7	10	15	Total			

Total No. of Unit for One Semester: **(20)**Units
Total No. of Unit for Year: **(40)** Units

مجموع الوحدات للفصل الدراسي الواحد: (20) وحدة
مجموع الوحدات لسنة دراسية: (40) وحدة