

الجامعة الإماراتية الدولية كلية الهندسة وتكنولوجيا المعلومات برنامج الذكاء الاصطناعي

وصف المقررات الدراسية

Courses Description





لبرنامج الذكاء الاصطناعي

المست

ــــوى الاول

				الفصل الدراسي الأول									
C.H.	L.	Т.	Р.										
2	2			لغه عربيه I (UNI 103)									
والتحدث	القراءة	ماعو	ت الاست	يهدف هذا المقرر إلى تزويد الطلبة بالمهارات اللغوية التي يحتاجونها في حياتهم العلمية والعملية، ويتناول مهارا									
يا النحوبة	, القضا	ے اصيل	ول في تف	والكتابة، وأهم الأسس النحوية والإملائية. وتركز موضوعاته على الدور الوظيفي لهذه المهارات من دون الدخر									
ة والنحوية	ء اللغود	لأخطا	۔ ـ لو من اا	واللغوبة، فاهتم بمرتكزات كلّ مهارة، وتدريب الطلاب على اكتسابها بما يمكنهم من استخدامها استخداما يخ									
				والإملائية.									
C.H.	L.	Т.	Ρ.	(LINU 405) Lättete tiläet									
2	2			لغ» (UNI 105) الجنيري» (UNI 105)									
This cours	se is a s	kill-b	based co	ourse that focuses on elementary skills of listening, speaking, reading and writing. The course is									
a pre-requ	uisite fo	or the	Englis	h 102. It develops students' language skills and competencies by exposing them to a variety of									
short gen	eral an	d aca	demic	contexts at the beginner level. In addition, the course builds the students' basic vocabulary and									
grammar	structu	ires tl	hat ena	ble them to communicate orally and in writing in limited contexts. Interactive exercises and									
tasks will	be enc	ouraș	ged in a	order to strengthen students' confidence in using English.									
<u>с н</u>	1	т	D										
2	۲ ،	••	••	الثقافة الإسلامية (UNI101)									
2	2												
C.H.	L.	Т.	Ρ.	$(11NU107)$ to $u \in \mathbb{N}$									
2	2			المصراع المريبي (و مراسيني (UNITOP)									
C.H.	L.	Т.	Ρ.										
3	2		2	معدمة في الحاسوب (UNI109)									
The aim o	f this c	ourse	e is to g	ive student the fundamentals of computer. It focuses on introduction to computer topics with									
an empha	sis on	learn	ing abo	but computer, operating systems, application software, Internet, and applying software using									
, MS Office	. The c	ourse	e helps	student to learn about the importance of computers and how to use computers.									
			•										

حداثة وتميز



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C.H.	L.	T.	Ρ.							
3	2	2		(EITTT) ۲ ریکوت						
This cours science ar functions, derivative calculus in rates, app and logar	e aim nd eng limits s of ex ncludir lied m thmic	s to g inee and kpon ng: cu naxim func	get stud ring. Co contin ential a urve sk num ar stions.	dents acquainted with basic concepts of differential calculus and its various applications in ourse topics cover real numbers, inequalities, absolute value, exponential and logarithmic nuity, differentiation rules, derivatives of trigonometric functions and their inverses and the and logarithmic functions. The course focuses as well on the applications of differential etching, relative and absolute extrema, Rolle's theorem, mean-value theorem, related and minimum problems, applications in business and economics., applications of exponential						
C.H.	L.	Τ.	Р.							
3	2	2		الإحصاء والاحتمالات (EI1210)						
This cours theory an central te famous d the cours such as E	se aim Id stat Indenci Istribu e focu Excel,	is to istic cy ar utior ises SAS	provid al anal nd vari ns such on cor S, SPS	de students with the fundamental knowledge and understanding of the probability lysis. Course topics include types of data, graphs and representation, measures of ation, correlation and regression, the principles of probability theory, some types of a as Z- distribution, Student t distribution and Chi-Square distribution. In addition, nducting and interpreting statistical experiments using popular statistics packages or MatLAB.						
				الفصل الدراسي الثاني						
		T. P.								
C.H.	L.	т.	Ρ.	(LINU102) ă. thati ățiăți						
С.Н. 2	L. 2	Т.	Р.	الثقافة الوطنية (UNI102)						
С.Н. 2	L. 2	Τ.	Р.	الثقافة الوطنية (UNI102)						
С.Н. 2 С.Н.	L. 2 L.	т.	Р. Р.	الثقافة الوطنية (UNI102) لغة انجليزية II (UNI 106)						
С.Н. 2 С.Н. 2	L. 2 L. 2	т.	Р. Р.	الثقافة الوطنية (UNI102) لغة انجليزية II (UNI 106) ا						
C.H. 2 C.H. 2 This cours	L. 2 L. 2 e build	T. T.	P. P. what s	الثقافة الوطنية (UNI102) (UNI 106) الغة انجليزية الا (UNI 106) tudents have learned in English 101. It provides more practice and learning experiences for						
C.H. 2 C.H. 2 This cours students t	L. 2 L. 2 e build	T. T. Is on lop t	P. P. what s	الثقافة الوطنية (UNI102) الثقافة الوطنية (UNI 106) التقافة الوطنية (UNI 106) التقافة الوطنية (tudents have learned in English 101. It provides more practice and learning experiences for mentary skills of listening, speaking, reading and writing. In addition, the course builds the						
C.H. 2 C.H. 2 This cours students to students' a	L. 2 L. 2 e build o deve	T. T. lop tl	P. P. what s heir ele	الثقافة الوطنية (UNI102) الثقافة الوطنية (UNI 106) التقافة الوطنية (UNI 106) التفة الجليزية الاستفادة العامي tudents have learned in English 101. It provides more practice and learning experiences for mentary skills of listening, speaking, reading and writing. In addition, the course builds the age use through equipping them with a wide range of vocabulary, grammatical structures and						
C.H. 2 C.H. 2 This cours students to students' a expression	L. 2 L. 2 e build bo deve ability ns relev	T. T. lop the	P. P. what s heir ele e langu to gene	الثقافة الوطنية (UNI102) الثقافة الوطنية (UNI 106) التقافة الوطنية (UNI 106) التقافة الوطنية (UNI 106) التقام المجلزية العامي العام المحمد المحمد والمحمد المحمد						
C.H. 2 C.H. 2 This cours students to students' a expression and conve	L. 2 L. 2 build bodeve ability ns relev rsation	T. T. lop the vant the vant the	P. P. what s heir ele e langu to gene the ele	الثقافة الوطنية (UNI102) الثقافة الوطنية (UNI 106) التقافة العربية (UNI 106) التقافة المعانية tudents have learned in English 101. It provides more practice and learning experiences for mentary skills of listening, speaking, reading and writing. In addition, the course builds the age use through equipping them with a wide range of vocabulary, grammatical structures and eral and academic contexts by exposing them to a variety of short general and academic texts mentary level. More learner-centered activities will be emphasized to enhance students'						
C.H. 2 C.H. 2 This cours students to students to students' a expression and conve independe	L. 2 L. 2 e build bo deve ability ins relev ins relev ins ation	T. T. lop tl in the vant t ns at rning	P. P. what s heir ele e langu to gene the ele	للثقافة الوطنية (UNI102) الثقافة الوطنية (UNI 106) الثقافة الوطنية (UNI 106) التقا لغة انجليزية الروان (UNI 106) التقا tudents have learned in English 101. It provides more practice and learning experiences for mentary skills of listening, speaking, reading and writing. In addition, the course builds the age use through equipping them with a wide range of vocabulary, grammatical structures and eral and academic contexts by exposing them to a variety of short general and academic texts mentary level. More learner-centered activities will be emphasized to enhance students'						
C.H. 2 C.H. 2 This cours students to students' a expression and conve independe C.H.	L. 2 L. 2 e build o deve ability ns relevents rsation ent lea L.	T. T. lop tl on the vant t rning T.	P. P. what s heir ele to gene the ele	لنقافة الوطنية (UNI102) النقافة الوطنية (UNI 106) النقاة العليزية الركان tudents have learned in English 101. It provides more practice and learning experiences for mentary skills of listening, speaking, reading and writing. In addition, the course builds the age use through equipping them with a wide range of vocabulary, grammatical structures and tral and academic contexts by exposing them to a variety of short general and academic texts mentary level. More learner-centered activities will be emphasized to enhance students'						
C.H. 2 C.H. 2 This cours students to students' a expression and conve independe C.H. 2	L. 2 L. 2 e build bo deve ability as relevents resation ent lea L. 2	T. T. lop the vant t rning T.	P. P. what s heir ele to gene the ele s. P.	الثقافة الوطنية (UNI102) الثقافة الوطنية (UNI106) التقافة الوطنية (UNI 106) التقافة العامي (UNI 106) التقافة العامي العامي العامي العامي الع						

والعملية، من خلال التعليم والتدريب على تجاوز المشكلات الكتابية في بيئة تعمل على تنمية التفكير الناقد وأساليب الإبداع، وما ينبغي أن



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مية الكتابة سة مهاراتها.	نافي بأه حة وتن	عي الثق لصحت	ناء الو ا	يتحقق من دقة التعبير الكتابي وأساليبه على المستويين الوظيفي والإبداعي، ويساعد على اكتساب المعرفة وب							
С.Н.	L.	T.	Р.								
3	2		2	(EI1112) از ریاصیات (EI1112)							
This cours in using v integratio of definite by partial trapezoid such as th	e aim: arious n of el integ fractio al rule e calci	s to g tech lemer grals – ons – and S ulatio	et stu nique ntary f the r trigor Simps n of: a	dents acquainted with basic concepts of definite and indefinite integrals and to assist them is to evaluate integrals, and realize integration applications in life. Course topics include: functions, definite integrals: sigma notation – fundamental theorem of calculus – properties nean value theorem for integrals, integration techniques: integration by parts – integration nometric substitution – integrating power of trigonometric functions, numerical integration: on's rule. In addition, applications of integration in engineering and physics are introduced area, volume, arc length, centre of mass, moments,etc.							
С.Н. 3	L. 2	T.	Р.	Communication skills (EIT212)							
Commun engineeri as well as such as reports an	icatio ng an s in w contri nd wo	n ski d it st ritten butin rking	lls ar uden , wit g to g effe	e essential to a successful career in Engineering. This communication course for the ts will enable them to develop the ability to communicate efficiently in English, orally hin the field of engineering. Students will also train and develop interpersonal skills discussions, making presentations, reading and synthesizing information, writing ctively with colleagues and other professionals in the engineering field.							
С.Н. 3	L. 2	Т.	Р. 2	Computer Programming I (AI130)							
This is an programm the princi arithmetic one-dimei	introc ing lai ples o opera nsiona	luctor nguag f prod tions, l array	y cou es top cedura input v. The	rse on the fundamentals of computer programming. It focuses on introduction to computer bics with an emphasis to use it to solve mathematical and scientific problems. The course covers al programming, data types, variables declarations, constants variables, memory locations, c and output operations, Sequences statements, Selection statements, Iteration statements and course helps student to design, write, and implement computer programs.							
С. Н . 3	L. 2	Т. 2	Ρ.	Discrete Mathematics (EIT114)							





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				المستحصيصوى الثاني									
	الفصل الدراسي الأول												
С.Н. 2	L.	Τ.	Р.	Technical English (EIT211)									
This is an give stud presents This count technical	This is an English for Specific Purpose (ESP) course for engineering and IT students. The course aimed to give students the specialized technical language, information, and skills needed for their program of study. It presents them with the appropriate English from a variety of technological, engineering and industrial fields. This course also enables students to produce organized reports, formal letters/emails, CVs that conform to technical format/style, audience, vocabulary, grammar and the use of graphics where appropriate.												
C.H.	L. 2	Т.	Р. 2	Computer Network I (IT230)									
	Z		۷										
C.H.	L.	Τ.	Р.	Computer Programming II (AI231)									
3	2		2										
This cour variety of programmi include: 1 and debu	rse is f don ning multi gging	the nains cond -dim g and	seco s, and cepts nensi d test	nd course of computer programming language. It considers problems drawn from a d emphasizes both the broader applicability of the relevant data structures and a, as well as the implementation of those structures and concepts in software. Topics onal arrays, search, sort, characters and string; pointers, references, functions, files, ting.									
C.H.	L.	T.	P.										
3	2		2	Computer Architecture and Organization (AI241)									
This count develop to designed equations designing	This course intends to teach students what is the fundamentals of computer architecture and organization, to develop the ability to perform programming in an assembly language, to know how RISC Instruction sets are designed, how single cycle CPU and cache memories, designed, and evaluated using simple performance equations. The objective of this course is to explore modern computer architecture approaches, such as designing advanced computer instructions, parallelism, and the advanced methods of data processing.												
C.H.	L.	T.	Р.	Lincor Algebra(AJ221)									
3	2	2		Linear Aigebra(A1221)									
The purpo homogene vector spa	ose of ous lin ice, th	this near nen t	cours equat o int	se to study and solve engineering problems by applying system of homogenous and non- tions and its representations geometric, similarly to study matrices and its transformations, roduces the applications of this skills on the special subjects.									

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C.H.	L.	Т.	Р.	Databaso Systems (A1223)
3	2		2	Database Systems (AI223)

This course "DBMS" is aimed at equipping students with the knowledge of database design, as well as, the ability to use database management systems in an effective manner. The course will provide fundamental knowledge of, and practical experience with, database concepts. Includes fundamentals of database architecture, information concepts and the realization of those concepts using the relational data model. Practical experience gained designing and constructing data models.

				الفصل الدراسي الثاني
C.H.	L.	Т.	Р.	Web Technology Eurodemontals (A1226)
3	2		2	Web Technology Fundamentals (Al230)
The aim side. It co that desc This cou modern y	of thi overs ribe l rse fo web s	is co HT now ocuse ites.	urse ML : that es on	is to introduce students to the essential technologies for web design from the client 5 which is used to describe the content in a web page, Cascading Style Sheets (CSS) content should look, and JavaScript to add interactivity and behaviors to web pages. Theoretical and practical aspects to improve students skills and abilities for designing
C.H.	L.	T.	Р.	Data Structures (A1232)
3	2		2	
Three prin linear dat: given real achieve th characteri basics of structures the Abstra different a	mary a strue l worl nese g stics algori such act Da algori	goals cture d pro coals, / maj thm as: I ata T thms	s of the s. The blem the cor of analy linke on s	talking, it forms the backbone of computing. his course. First one is to develop skills of designing and analyzing simple linear and non- e second goal is to make students able to identify and apply the suitable data structure for a 1. Last goal, it enables them to gain knowledge in practical applications of data structures. To course must cover Basic and Advanced data structures topics. The basic topics include the 'the linear data structures (Array) from the perspective view of physical storing. Also, the 'sis (time & space complexity estimation). The advanced topics include the non-linear data d Lists, Trees, Graph, and Memory Management. Further, students will learn and implement of Stack and Queue in linear and non-linear fashion. Finally, students will learn and implement earching, sorting, and hashing techniques.





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C.I.I.	L +	••	••	Introduction to Artificial Intelligence (IT404)
3	2		2	Introduction to Artificial Intelligence (11481)
The goal that the c limited in intelligen technique	of A omp nform nce by nce as es, H	rtific uter natio y co s rep ybric	cial I syste on an- verin reser d inte	ntelligence is to build software systems that behave "intelligently". By this, we mean yms "do the right thing" in complex environmentsthat they act optimally given the d computational resources available. This course provides an introduction to artificial ag the following topics: An overview of Artificial Intelligence (AI), Artificial ntation and search, Knowledge representation and reasoning, Machine learning elligent techniques and maintenance of intelligent systems.
C.H.	L.	т.	Р.	Object Originated Dreamsming (A1220)
3	2		2	Object-Oriented Programming (AI230)
This cour learnt bas object-or objective Encapsul and impl visual co event-has	rse in sic pr iente s wit ation emer mpon ndler	ntrod cogra d pro h us n, Inh ntatic nents s, ex	uces amm ogran e to nerita on, da s (wi cept	a concept of object oriented programming and visual programming to those who have ing concepts and are ready to learn in-depth programming. It is an expository of the mming methodology with emphasis on software design and code reuse as its core GUI components. The main concepts discussed are: Objects, Data Abstraction, Data ance, and Polymorphism. In addition to window-based, event-driven application design ata types, operators, properties, menus, and database file processing, and building ndows, menus, message-boxes, buttons, lists, etc.), managing containers and layout, ions, and employing GUI class libraries.
C.H.	L.	Τ.	Р.	On anoting Custome (AIO40)
3	2		2	Operating Systems (AI240)
The cour fifty year will cove impleme process r managen Architect	se wi rs, an r the ntatio nanag nent. cure a	ill sta d the trad on of geme Acc and (art w en co eoffs f an c ent, 1 ordin Drgan	ith a brief historical perspective of the evolution of operating systems over the last over the major components and structure of most operating systems. This discussion is that can be made between performance and functionality during the design and operating system. Particular emphasis will be given to these major OS subsystems: real and virtual memory management, file system and disk management, and I/O ng to the course plan of the program, the prerequisite of this course is Computer nization.
C.H.	L.	Т.	P.	Commuten Ething & legal Insura
3	2			Computer Etnics & legal Issues
This cours and legal crime, teo the impac to techno	se ain issue: hnolo t of t logy v	ns to s in t ogy a echn will b	prov he co nd w ology e dis	ide knowledge about computer ethics to make students understand the ethical, professional, imputing era. The course will cover many issues like privacy, intellectual property, computer ork freedom of speech, and ethical and professional responsibilities. This course will focus on y on us as individuals and on our society, so the social, legal, and economical effects related cussed through this course.
C.H.	L.	Τ.	P.	Project Management (IT221)
2	2			Project management (11521)

This course aims to provide students with basic knowledge for managing resources and scheduling, tracking and controlling and completing project within the specific constraints and deadlines. The course will focus on





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product life cycles, managing, planning, designing and controlling projects, human and logistics resources, systems' maintenance & reliability, industrial safety constraints, tools and techniques of quality cost. Students will develop skills in preparing feasibility studies and identifying elements for a success development of information system projects.





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				الفصل الدراسي الأول				
C.H.	L.	T.	P.	Design and Analysis Alexaidans(AI221)				
3	2		2	Design and Analysis Algorithms(AL331)				
The main goal of this course is to study fundamental techniques for designing efficient algorithms and analyzing their time and space complexity. Such techniques enable students to gain skills in developing efficient and reliable software programs with minimal cost. This course briefly covers growth of functions asymptotic notation, recurrences, sorting, searching, and graphs notations. In addition, the course focuses on some important approaches: dynamic programming, greedy algorithms, randomized algorithms, approximation algorithms, divide and conquer algorithms. Finally, the course focuses on proofs of NP-completeness, partial recursive functions, and proofs of undecidability								
C.H.	L.	Τ.	Р. Э	Programming for AI(AI333)				
Programm primary g suitable p learn stud achieve th language(k-Means algorithm .Further, s Robotics Encoders	ning f oals o rogra ents b nese g Lisp, Clusto),also studer Progr IMU	For A of thi mmin pasic goals, Prol ering stud nts w camm). Stu	I is the second	the core and backbone of the AI field and it plays a major role in the evolution of AI. Two irse. First one is to know about useful and modern AI programming language and selecting the nguages with the best capabilities for artificial intelligence problem. The second goal is to specific theories that make them haves high I programming skills on different areas of AI. To ents will learn specific topics related to AI programming: The most top AI programming 'ython, R),learn and implement some Machine Learning algorithms for AI (Feedforward NN, an Shift Clustering, Biometrics Recognition algorithms, Handwritten Digit Recognition will learn new tool kit called "AI-TOOLKIT that make Machine Learning easy to implement arn Game AI Programming (Theory and practical implementation).Finally, students will learn Theory and practical implementation using Python: Distance Sensors, RGB Strips, and s will be assigned some practical assignments and one project related to the field.				
C.H.	L.	T.	P.	Migrogentrollor(A1241)				
3	2		2	Mici oconti olici (A1541)				
This cours implemen applicatic Course to architectu microcon and micro and simul	se pro ntatio ons re pics o ures a trolle ocont ated	ovide n of lated cover ind a r-bas rollei micr	s gra micro I to a ; an i ssem sed sy rs lab ocon	duates with concepts, principles and programming skills to be considered in design and ocontroller-based systems, to meet their high grows & demands in variant environments and rtificial intelligence field such as, IoT, intelligent control, marketing, social and smart devices. ntroduction to microcontrollers types and applications, the PIC16F microcontrollers bly programming, PIC16F-MCs interrupts & timers and the design & implementation of ystems for monitoring & control. Throughout hands-on laboratory work in computer-based us, graduate swill develop their problem-solving & design skills related to both real platforms troller-based systems.				





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C.H.	L.	Т.	P.					N	Aach	inal	[00	rnir	ο σ (Δ	1261)				
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The course aims to help student understanding concepts of machine learning in order to solve various problems in different fields. The course focus on Learning and Machine Learning, methodology of Science in Learning. It will discuss how to build computer systems that learn from experience. It is a subfield of Artificial Intelligence and intersects with statistics, cognitive science, information theory, and probability theory, among others. The course will explain how to build systems that learn and adapt using real-world applications from industry and science (e.g., learning to classify astronomical objects, to predict medical diagnoses, to play chess, etc.).

Main topics include Expert Systems, linear discriminants, neural networks, decision trees, support vector machines, Genetic Algorithms and Evolutionary Computing unsupervised learning, reinforcement learning.

C.H.	L.	Т.	Ρ.	Image Brossering and Computer Craphics (A12(2))
3	2		2	mage Processing and Computer Graphics (A1565)

The subject is designed to build a solid knowledge of fundamentals of image processing and computer graphics in terms of theory and practices; besides, strong mathematical foundations. The course covers common topics in computer graphics such as 2D and 3D graphics, illumination; and necessary topics in image processing such as digital image processing, image enhancement in spatial and frequency domains, and image restoration. Students will learn how to apply, utilize, and use the methods and techniques to solve real world problems.

C.H. I	I. L. T. P.	E Ducinosa
3 2	2 2	L-DUSIIIESS

Students will be introduced with the principle concepts of e-business and e-commerce from the technological, organizational, and managerial standpoint. The course will include the concepts, definitions, framework, benefits, risks, and limitations related to e-business and e-commerce. Students through this course will acquire knowledge about, the current and emerging, e-business and e-commerce technologies using the Internet. This course will cover many topics like E environment, digital marketing, e-government, Digital business strategy, Supply chain Management, Customer relationship management. Moreover, the labs will help them to get better understanding of the theoretical part.

	الفصل الدراسي الثاني									
C.H.	L.	Т.	Р.							
3	2		2	Artificial Neural Network(A1300)						
The cours in differe	se aim nt fie	ns to Ids. 1	help The c	student understanding concepts of Artificial Neural Network in order to solve various problems ourse focus to help students to develop and refine their neural networks skills such as, it the						



الماراتية المولية سماراتية المولية سماراتية سماراتي سماراتية سماراتية سماراتية سماراتي سماريم سماراتي سماراتي سماراتي سماراتي سماراتي سماراتي سماراتي سماريم سمار سماريم سماريم سماريم سمار مماريم سماريم سمار مماريم سماريم ممار ممار مماريم ممارم ممارم مماريم ممارم ممارم مماريم ممارما ممارم مماريم ممارمام ممارمانام ممام ممارم ممام ممارمام ممارم ممام ممارم

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main concepts of neural networks, learning algorithms, information capacity, and mapping properties of feed forward and recurrent networks. Different neural network models, neural networks paradigms and concepts such as Perceptron, Hebbian learning, performance surfaces, optimization, multi-layer networks, back propagation, selforganizing maps, stochastic networks.

C.H.	L.	т.	Ρ.	
2	2		2	warehousing and Data Mining(A1302)

The course aims to help student understanding concepts of Knowledge Discovery and Data Mining (KDD). KDD deals with data integration techniques and with the discovery, interpretation and visualization of patterns in large collections of data. Topics include data warehousing and data preprocessing techniques; data mining techniques for classification, regression, clustering, deviation detection, and association analysis; and evaluation of patterns minded from data. The work discussed originates in the fields of artificial intelligence, machine learning, statistical data analysis, data visualization, databases, and information retrieval. Several scientific and industrial applications of KDD will be described.

C.H.	L.	Т.	Р.
3	2		2

This course focuses on the fundamentals of information security that are used in protecting both the information present in computer storage as well as information traveling over computer networks. Interest in information security has been spurred by the pervasive use of computer-based applications such as information systems, databases, and the Internet. Information security has also emerged as a national goal in the United States and in other countries with national defense and homeland security implications. Information security is enabled through securing data, computers, and networks. In this course, we will look into such topics as fundamentals of information security, computer security technology and principles, access control mechanisms, cryptography algorithms, software security, physical security, and security management and risk assessment. By the end of this course, you will be able to describe major information security issues and trends, and advise an individual seeking to protect his or her data.

C.H.	L.	Т.	Ρ.	Computer Vision(A1264)
2	2		2	Computer Vision(A1504)

This course aims to provide students with advanced knowledge on how to analyse and apply the algorithms and mathematics formulas to design and develop applications related to computer vision (CV). Computer vision aims to easies the solution of complex world problems by making sense of data provided by any visual sensors or devices. Topics include 2D and 3D imaging geometry, features extraction and detection, stereopsis, motion and optical flow, some algorithms and techniques in machine learning; and object detection, recognition, and tracking. Throughout lab works, Students will develop their skills in the analysis &





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developn project.	nent	of aj	oplic	ation related to CV by implementing studied algorithms and by completing a chosen
C.H.	L.	T.	Р.	Introduction to Software Engineering (AI240)
2	2		2	introduction to Software Engineering(A1340)
This cours topics incl engineerin software of with softw their care	ie ain luding ng, pr desig vare o ers.	ns at g soft rincip n, so devel	provi tware lles tl ftwar lopm	ing students with the fundamental concepts of software engineering. It covers essential e process, agility and process, recommended process model, human aspects of software hat guide practice, understanding requirements, software modelling, software architecture, re testing, and software maintenance. The main focus of this course is to introduce students ent life cycle, and thus improving their skills to adapt the culture of software engineering in
C.H.	L.	Т.	Ρ.	
2	2			Scientific Research Fundamentals(E11312)
The cour scientific process, 1 and analy presentat assigned	se ain rese form vsis, o ion. 1 by th	ms to arch ulati conc By th ne co	o intr . Stu ng re eptu ne en urse	roduce students to the basic concepts and issues of quantitative and qualitative dents will learn the nature and tools of research, the basic components of research esearch questions, research design, elements of analysis research papers, data collection alization and measurement, building evidence, research evaluation, documentation and do of the course students submit and present a research course-project on a topic instructor.
C.H.	L.	Т.	Р.	Mobile Applications Development(AI330)
3	2		2	
Students Topics ind applicatio such as so	Students will be introduced to programming technologies, design and development related to mobile applications. Topics include accessing device capabilities, industry standards, operating systems, and programming for mobile applications using an OS Software Development Kit (SDK). Moreover, the course covers the modern computer concepts, such as software, data distribution models, location awareness, networking, and telephony. The concepts in this courses			

are platform independent. Thus, lecturers are not tided to certain platform but have the choice to select the development environment either iOS, Android or any other platform. Upon completion, students should be able to create good applications for mobile devices.





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	الفصل الدراسي الأول					
C.H.	L.	т.	Р.			
3	3		2	Expert Systems(A1461)		
The cours different under und Intelligen industry. appropria introducir knowledg	e aim fields certai ce wh This c te kn ng the ge-bas	ns to . The nty, nich h cours owle e exp eed so	help e cou expe nas p e int edge pert s	student understanding concepts of expert systems in order to solve various problems in rse focus on representation of knowledge in expert systems, methods of inference, reasoning rt systems shells, classic expert systems, Prolog, and CLIPS. It is a subfield of Artificial roduced the most successful practical applications, and is used most widely in business and roduces students to recognize what problems are appropriate for expert systems, select an representation and reasoning method, and anticipate potential difficulties in developing and ystems. Also, it provides students the ability to design an expert system using appropriate are tools.		
СЦ	1	т	D			

Deep Learning (DL) is a branch of machine learning concerned with the development and application of modern artificial neural networks from raw data for learning complex. DL is one of the most exciting and promising segments of Artificial Intelligence (AI) and Machine Learning (ML) technologies.

Deep Learning(AI463)

In this course students will learn the fundamental principles, underlying mathematics, and implementation details of deep learning. This includes the concepts and methods used to optimize these highly parameterized models (gradient descent and backpropagation, and more generally computation graphs), the modules that make them up (linear, convolution, and pooling layers, activation functions, etc.), and common neural network architectures (convolutional neural networks, recurrent neural networks, etc.). Applications ranging from computer vision to natural language processing and decision-making (reinforcement learning) will be demonstrated. Further, students will learn how to implement these fundamental building blocks as well as how to put them together using a popular deep learning library. Prerequisites: a strong mathematical background in calculus, linear algebra, and probability & statistics, as well as strong programming skills specifically in Python and C/C++.

С.Н.	L.	Τ.	Ρ.	Big Data Application (A1465)
3	2		2	big Data Analytic(A1403)

The concept of big data refers to massive and often unstructured data, on which the processing capabilities of traditional data management tools result to be inadequate. This course aim to provide students a broad understanding of big data concepts, tools, techniques ,platforms, practices of big data computing , and current technologies in managing and processing them. Topics covered include big data analytics lifecycle, predictive and descriptive techniques, unstructured big data analytics tools, and the key issues in big data management systems. It covers also current trends and issues related to big data such as cloud

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& big data, social media analytics, big data stream, Internet of Things (IoT), and emerging big data technology and tools such Hadoop, MapReduce, Pig, Hive and Spark platforms.

C.H.	L.	Т.	Р.	Polating(AI467)
3	2		2	KODOUCS(A1407)

Robotics science becomes increasingly important because of the vast areas of its industrial and nonindustrial applications. This course provides students with the essential knowledge and skills needed to design systematically a robot for a particular task with certain level of intelligence. The course focuses on arm-type robots; course topics include spatial transformations, robot arms' configurations, forward and inverse kinematics and dynamics, programming and control methods as well as the algorithms required for planning and generating the robot motion. Students will be able to connect theory to practice through hands-on laboratory works and course-project work.

				الفصل الدراسي الثاني
C.H.	L.	Т.	Ρ.	Data Science (A1466)
3	3		2	Data Science(A1400)
T .1 '	1		1	

In this era, where a huge amount of information from different fields is gathered and stored, its analysis and the extraction of value have become one of the most attractive tasks for companies and society in general. The design of solutions for the new questions emerged from data has required multidisciplinary teams. Computer scientists, statisticians, mathematicians, biologists, journalists and sociologists, as well as many others are now working together in order to provide knowledge from data. This new interdisciplinary field is called Data Science (DS). The pipeline of any data science goes through asking the right questions, gathering data, cleaning data, generating hypothesis, making inferences, visualizing data, assessing solutions, etc.

The primary goal of this course is for students to learn data analysis concepts and techniques that facilitate making decisions from a rich data set. To achieve this goal, students will learn: Fundamentals about data & the Toolbox used for Data Science, Descriptive Statistics, Statistical Inference, Supervised & Unsupervised Learning, Regression & Network Analysis, Recommender Systems, Statistical Natural Language Processing for Sentiment Analysis, and finally Parallel Computing.



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وصف المقررات الدراسية Courses Description

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المستحررات الاختياريسسة في البرنسسسامج

C.H.	L.	Τ.	Ρ.	Optimization Modelling Techniques(A1404)
3	2		2	Optimization Moderning Techniques(AI494)

Optimization is the process of obtaining the best results under given circumstances to make the perfect decisions. The ultimate goal of all such decisions is either to minimize the effort required or to maximize the desired benefit. This course aims to provide students a broad understanding of optimization modelling techniques ,concepts, methods, tools and practices of optimization computing. Topics covered include introduction to the course, classical Optimization Techniques, linear and dynamic programming, unconstrained and constrained optimization, metaheuristic algorithms, and advanced topic such as multi-objective optimization Genetic algorithms, few applications based on nature inspired optimization techniques and fuzzy logic.

C.H.	L.	Т.	Р.	Internet of Things (IT 422)
3	2		2	Internet of Things(11455)

This course aims to introduce a fundamental knowledge about Internet of Things (IoT) along with its technology, architecture applications, trends, concerns and challenges. It covers the topics related to IoT elements, domains, devices, embedded systems, connectivity and networks, computing analytics and applications. In addition, it present IoT evolution, statistics, forecasts, business models, communication and development primitives, and data explosion in IoT. Also, it addresses the computing paradigms in connected and autonomous driving vehicles such as artificial intelligence, vehicular cloud computing, and end-to-end networking, as well as describing security and safety issues. This course focus to provide the student with practical experiences about the Industrial IoT and how to design an IoT device to work with a cloud computing infrastructure and applications along with its security issues.

C.H.	L.	Т.	Ρ.	Special Topics in AI(AI400)
3	2		2	Special Topics III AI(A1490)

Artificial Intelligence as a field aims to create systems that resemble or reproduce intelligent

behaviour using machines. This course is very special course of selected topics in AI that will provide students a broad overview over the highlighted as hot research trends of AI.It covers many modern topics that includingintelligent systems, planning, uncertainty, decision making, cognitive systems, bioinformatics, virtual and augmented reality, game theory and digital twins. There is a flexibility to change some topics according to change of research trend.





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C.H.	L.	Т.	Ρ.	Distributed and Cloud Computing (IT222)
3	2		2	Distributed and Cloud Computing (11332)

This course provides an exploration of distributed and cloud computing, focusing on the principles, technologies, and applications that underpin these rapidly evolving fields. Students will gain an understanding of distributed systems, including concepts such as scalability, fault tolerance, and load balancing, as well as the design and implementation of distributed systems. The course will also cover cloud computing architectures, virtualization techniques, and the deployment of applications on popular cloud platforms. Through hands-on projects and case studies, students will develop practical skills in designing, building, and managing distributed and cloud-based systems, preparing them for careers in the dynamic world of modern computing infrastructures.

C.H.	L.	Т.	P.	Machine Translation (MT) (AI496)
3	2		2	
Machine Translation (MT) deals with computers translating human languages. The field is now sufficiently mature that Google use it to allow millions of people to translate Web Documents each day. This course focuses on the use of fundamental ideas from algorithms and linguistics, showing how they apply to a real and difficult problem in artificial intelligence. It deals with all aspects of designing, building and evaluating a range of state-of-the-art translation systems. The systems covered are largely statistical models. As well as exploring these systems, the course will cover practical aspects such as using very large training datasets, evaluation and the open problem of whether linguistics can be useful for translation.				
C.H.	L.	Т.	Р.	Natural Language Processing (NLP) (AI492)
3	2		2	
The main goal of this course is to master the basics of natural language processing (NLP), a vibrant interdisciplinary field. The course covers the methods and approaches used in many real-world NLP applications such as language modeling, text classification, sentiment analysis and summarization. The course will not only cover using some of the existing NLP libraries and software packages, but also cover the principles behind their design, and about the mathematical models underlying modern computational linguistics. The course also involves completing practical				

programming assignments in Python and conducting experiments on texts written in English and Arabic.

