University of Technology – Iraq

Department of Computer Science

The Guide for Artificial Intelligence Branch

2024 – 2025

Contents

1. The Computer Science Department

1.1. The Establishment of the Computer Science Department

The computer science department at the University of Technology - Iraq was established in 1983 to keep up with the developments in the field of computer science to employ them in applied fields and prepare students to be specialists in this vital field to serve our beloved country in all sectors that require this important specialization. The department grants Bachelor's degrees (BSc), Diploma (DIP), Master's (MSc) and Doctorate (PhD) in specialization of computer science. Since the beginning of the department's establishment, its most important objective has been to work towards scientific specialization. Currently, the department grants bachelor's degrees in six specializations: Software, Information Systems, Artificial Intelligence, Computer Security and Cyber Security, Network Management, and Multimedia. Students study these sciences' theoretical and applied aspects during their academic stages, noting that the practical aspect is an important part of the study requirements. The department provides specialized consultations in the field of computers to all country institutions. It also has a tangible activity with employees in state departments by holding annual courses specialized in computer science. These courses are organized at the Continuing Education Center.

1.2. The Vision of the Computer Science Department

The vision of the department in the foreseeable future is to follow the rapid developments in the field of computer science and its applications in the department’s curricula and to graduate qualified and efficient staff in the field of computer science with undergraduate and graduate degrees.

1.3. The Letter of the Computer Science Department

The letter of the department is based on the precise specializations of computer science, as the department has six branches:

- Software Branch
- Information Systems Branch

- Artificial Intelligence Branch
- Computer Security and Cyber Security Branch
- Network Management Branch
- Multimedia Branch

The department seeks to create new branches in the field of computer science applications and to determine the graduate's specifications in a manner that is compatible with the requirements of the field of work in all scientific and educational aspects and at both the undergraduate and graduate levels (Master's and Doctorate).

1.4. The Objectives of the Computer Science Department

The objective of the department is to graduate students in the precise specializations of computer science in its precise specialized branches, in addition to preparing advanced and specialized staff in postgraduate studies for Master's and Doctorate degrees in computer science to meet the needs of society and government departments and institutions for specialists in this field.

1.5. The Council of the Computer Science Department

The Computer Science Department Council includes:

Prof. Dr. Alaa Khadem Farhan	Head of Department and Dean	Chairman
Asst. Prof. Dr. Mustafa Jasim Hadi	Assistant Head of Department for Academic Affairs	Member
Asst. Prof. Dr. Bashar Sa'adoon Mahdi	Assistant Head of Department for Administrative Affairs	Member
Prof. Dr. Ahmed Tariq Sadiq	Faculty Representative	Member
Asst. Prof. Dr. Ayad Hazem Ibrahim	Head of Software Branch	Member
Asst. Prof. Dr. Athraa Jasim Mohammed	Head of Information Systems Branch	Member
Dr. Dena Kadhim Muhsen	Head of Artificial Intelligence Branch	Member
Dr. Rana Mohammed Zaki	Head of Computer Security and Cyber Security Branch	Member

Dr. Saif Bashar Nima	Head of Network Management Branch	Member
Dr. Nada Hussain Ali	Head of Multimedia Branch	Member
Dr. Mustafa Tariq Abbed	Department Rapporteur	Member

2. The Artificial Intelligence Branch

2.1. The Establishment of the Artificial Intelligence Branch

The Artificial Intelligence Branch was established in 2002 – 2003 within the branches of the department. The purpose of opening this branch was to meet the needs of society and keep up with the development in terms of the overlap of intelligence with modern software technologies. In addition to preparing specialized staff in the field of intelligent applications and technologies by acquiring special skills in preparing, designing and building intelligent behavioral and deductive performance systems that simulate human behavior in solving complex problems. The graduate of the Artificial Intelligence Branch works in the field of understanding, designing and developing intelligent programs and systems. He/she also has expertise in methods of representing knowledge and methods of inferring facts, through which access to the integrated automated implementation of systems is achieved, reaching the goal of solving problems of multiple or complex types.

2.2. The Vision of the Artificial Intelligence Branch

The branch seeks to qualify highly qualified graduates in the field of artificial intelligence, who possess the skill to apply systematic methods in analyzing and designing artificial intelligence applications and compete worthily in the market of specialized applications, devices, and intelligent software technologies.

2.3. The Letter of the Artificial Intelligence Branch

The branch seeks to prepare distinguished staff to meet the requirements of the labor market and be capable of acquiring and understanding artificial intelligence skills represented in programming and managing intelligent systems and devices by developing learning and teaching skills for faculty members and students.

2.4. The Objectives of the Artificial Intelligence Branch

The objectives of the Artificial Intelligence Branch are as follows:

a. **The First Objective:** Understanding and supporting the relationship between artificial intelligence and the needs of society and developing the field of knowledge.
b. **The Second Objective:** Encouraging scientific research in the fields of theoretical and practical intelligent systems and applications.
c. **The Third Objective:** Employing the branch's students' graduation projects to solve real and practical problems that appear in the public and private sectors and through participation and interaction with these two sectors.

2.5. The Council of the Artificial Intelligence Branch

Dr. Dena Kadhim Muhsen	Chairman
Prof. Dr. Ahmed Tariq Sadiq	Member
Prof. Dr. Hana Muhsen Ahmed	Member
Prof. Dr. Hassanen Sameer Abdullah	Member
Asst. Prof. Dr. Suhad Malullah Khadem	Member
Asst. Prof. Dr. Israa Abdulameer Abduljabar	Member
Asst. Prof. Dr. Mustafa Jasim Hadi	Member
Asst. Prof. Dr. Hiba Basim Alwan	Member
Dr. Mustafa Tariq Abbed	Member
Asst. Prof. Sura Mahmoud Abdullah	Member
Lec. Alaa Abdulhussaen Hashim	Member
Lec. Noor Haider Abdulameer	Member and Rapporteur
Asst. Lect. Ahmed Hameed Ahmed	Member
Asst. Lec. Mohammed Thameer Abdulhadi	Member
Asst. Lec. Fadhel Abbas Fadhel	Member

2.6. The Specifications of the Graduated Students and Work Fields

Graduating qualified students to work in the field of artificial intelligence and providing them with the skills to design and develop intelligent applications and technologies by acquiring the specific skills in preparing, designing and building intelligent behavioral and deductive performance systems with a nature that simulates human behavior in solving complex problems or problems that lack or lack appropriate or best solutions. After graduation, the student will have job opportunities in many fields, including local and

international institutions and companies with an intelligent technical nature, many parties are interested in how to benefit from facts and evidence to reach optimal solutions in solving their problems, information technology centers.

2.7. The Hardware Components of the Artificial Intelligence Branch

a. **Classrooms:** Classrooms have been prepared for the Artificial Intelligence branch with the necessary supplies provided.

b. **Laboratories:** Several specialized laboratories have been prepared for the Artificial Intelligence branch, equipped with computers with modern specifications, high efficiency and accuracy that support intelligent software and human-robot programming, in addition to the physical components (robots) that meet the student's practical needs within the precise scientific specialization.




2.8. The Scientific Committee of the Artificial Intelligence Branch

Prof. Dr. Ahmed Tariq Sadiq	Chairman
Prof. Dr. Ayad Rodhan Abbas	Member
Prof. Dr. Hassanen Sameer Abdullah	Member
Asst. Prof. Dr. Suhad Malullah Khadem	Member
Asst. Prof. Dr. Shatha Habeb Jaafar	Member and Rapporteur

2.9. The Academic Guide of the Artificial Intelligence Branch

Asst. Prof. Dr. Suhad Malullah Khadem	Chairman
Dr. Mustafa Tariq Abbed	Member
Asst. Lect. Ahmed Hameed Ahmed	Member and Rapporteur

2.10. The Study Plan and the Guidance for the Course System to Obtain the Bachelor's Degree in the Artificial Intelligence Specification

A Bachelor's degree in Artificial Intelligence / Computer Science Department / Technological University - Iraq is awarded after the student completes the academic subjects in all stages shown in the tables below.

Artificial Intelligence Curricula (2024 – 2025)

First Stage Curriculum - Bologna System - First Course

ECTS	USSWL	SSWL	Exam (Hours)	Tutorial	No. of Lab hour	No. Of Theory hour	Subject Code	Subject	اسم المادة	ت
8	92	108	3	1	2	4	PRFU111	Programming Fundemental	اساسيات ال .بمجة	1
8	92	108	3	1	2	4	MATH112	Mathematics	الرياضيات	2
6	57	93	3	2		4	STPR113	Statistics and Probability	الاحصاء والاحتمالات	3
4	37	63	3	2		2	PRAI114	Principles of Artificial Intelligence	مبادىء الذكاء الاصطناعd	4
2	17	33	3			2	DEHR105	Democracy and Human Right	الديمقراطية وحقوق الانسان	5
2	3	47	2		3		WORK106	Workshop	المعامل	6
30	298	452		6	7	16		Total		

First Stage Curriculum - Bologna System - Second Course

ECTS	USSWL	SSWL	Exam (Hours)	Tutorial	No. of Lab hour	No. Of Theory hour	Subject Code	Subject	اسم المادة	ت
8	92	108	3	1	2	4	STPR121	Structure Programming	ال .بمجة المهيكلة	1
5	62	63	3	1		3	DIST122	Discrete Structures	الهياكل المتقطعة	2
6	57	93	3	1	2	3	COLD123	Computer Organization and Logic Design	تركيب الحاسوب والتصميم المنطقي	3
5	47	78	3	1	2	2	PRLA124	Prolog Language	لغة برولوك	4
4	37	63	3	2		2	KNRM125	Knowledge Representation Methods	طرق تمثيل المعرفة	5
2	3	47	2		3		WORK106	Workshop	المعامل	6
30	298	452		6	9	14		Total		

Second Stage Curriculum - Bologna System - First Course

ECTS	USSWL	SSWL	Exam (Hours)	Tutorial	No. of Lab hour	No. Of Theory hour	Subject Code	Subject	اسم المادة	ت
8.00	92	108	3	1	2	4	OBOP211	Object Oriented Programming	برمجة شيئية	1
5.00	47	78	3	1	2	2	DAST212	Data Structures	هياكل بيانات	2
5.00	47	78	3	1	2	2	NUAN213	Numerical Analysis	تحليل عددي	3
5.00	47	78	3	1	2	2	PYLA214	Python Language	لغة البايثون	4
5.00	47	78	3	1	2	2	SEST215	Searching Strategies	استراتيجيات البحث	5
2.00	17	33	3	-	-	2	CBRI201	Crimes of the Baath regime in Iraq	جرائم نظام البعث في العراق	6
30.00	297	453	18	5	10	14		Total		

Second Stage Curriculum - Bologna System - Second Course

ECTS	USSWL	SSWL	Exam (Hours)	Tutorial	No. of Lab hour	No. Of Theory hour	Subject Code	Subject	اسم المادة	ت
5.00	82	93	3	1	2	2	DATA221	DataBase	قواعد بيانات	1
5.00	47	78	3	1	2	2	MICR222	Microprocessor	معالجة مايكروبة	2
4.00	47	78	3	1	2	2	SOSA223	Sorting and Searching Algorithms	خوارزميات البحث والترتيب	3
5.00	37	63	3	1	2	2	FULO224	Fuzzy Logic	منطق مضبب	4
2.00	47	78	2	1	-	2	HESM225	Heuristic Search Methods	طرق البحث الموجهه	5
2.00	17	33	3	1	2	2	ENLA207	English language	اللغة الانكليزية	6
30.00	17	33	2	-	-	2	ARLA204	Arabic language	اللغة العربية	7
5.00	294	456	21	6	10	16		Total		

Third Stage Curriculum - Course System - First Course

			No. of Units	Tutorial	No. of Lab hour	No. Of Theory hour	Subject Code	Subject	اسم المادة	ت
			3	1	2	2	CSCL3123	Microprocessor	معالجة مايكروية	1
			2	1	-	2	CSCL3125	Computation Theory	نظرية احتسابية	2
			2	-	-	2	CSCL3127	Operations Research	بحوث عمليات	3
			3	1	2	2	CSAI3107	Computer Graphics 2D	رسوم الحاسوب ثنائية الابعاد	4
			3	1	2	2	CSAI3108	Natural Language Processing	معالجة اللغة الطبيعية	5
			3	-	2	2	CSAI3109	Algorithm and its Complexities	الخوارزميات وتعقيدها	6
			3	1	2	2	CSAI3212	Heuristic Search Methods	طرق البحث الموجهه	7
			2	-	-	2	CSCL3133	English Language 3	لغة انكليزية3	8
			21	5	10	16		Total		

Third Stage Curriculum - Course System - Second Course

			No. of Units	Tutorial	No. of Lab hour	No. Of Theory hour	Subject Code	Subject	اسم المادة	ت
			3	1	2	2	CSCL3224	Computer Architecture	معمارية الحاسوب	1
			3	1	2	2	CSCL3226	Compiler Design	تصميم مترجمات	2
			2	-	-	2	CSCL3228	Optimization	الامثلية	3
			3	1	2	2	CSAI3211	Visualization	المرئية الافتراضية	4
			3	-	2	2	CSAI3110	Expert System	الانظمة الخبيرة	5
			3	-	2	2	CSAI3213	Speech Recognition	تمييز الكلام	6
			3	-	2	2	CSAI3214	Machine Learning	تعلم الماكنة	7
			20	3	12	14		Total		

Fourth Stage Curriculum - Course System - First Course

			No. of Units	Tutorial	No. of Lab hour	No. Of Theory hour	Subject Code	Subject	اسم المادة	ت
			3	1	2	2	CSCL4134	Static Web Programming	برمجة المواقع الثابتة	1
			3	1	2	2	CSCL4136	Operating system 1	نظم تشغيل1	2
			3	1	2	2	CSCL4138	Data Security1	امنية بيانات1	3
			3	1	2	2	CSAI4115	Computer Network	شبكات الحاسوب	4
			3	-	2	2	CSAI4116	Planning & Robotics	التخطيط والانسان الالي	5
			2	-	-	2	CSAI4117	Data Warehouse	مخازن البيانات	6
			17	4	10	12		Total		

Fourth Stage Curriculum - Course System - Second Course

			No. of Units	Tutorial	No. of Lab hour	No. Of Theory hour	Subject Code	Subject	اسم المادة	ت
			3	1	2	2	CSCL4235	Dynamic Web Programming	برمجة مواقع متغيرة	1
			3	1	2	2	CSCL4237	Operating system 2	نظم تشغيل2	2
			3	1	2	2	CSCL4239	Data Security 2	امنية بيانات2	3
			3	1	2	2	CSAI4218	Machine Vision	الرؤيا بالماكنة	4
			3	-	2	2	CSA18	Advanced Intelligent Search	بحث ذكي متقدم	5
			2	-	-	2	CSAI4220	Data Mining	تنقيب البيانات	6
			2	-	-	2	CSCL4142	English Language 4	اللغة الانكليزية4	7
			6	-	4	4	CSCL444	Project	المشروع	8
			25	4	14	18		Total		