Computer Security

&

Syber Security Branch's Guideline

2025-2024

University of Technology_ Iraq

Computer Science Department
Computer Security &Cybersecurity

Program: Bachelor in (Computer Security &Cybersecurity)

Contents

Introduction to the Department of Computer Science

The Department of Computer Science was established at the University of Technology in 1983 to keep pace with developments in the field of computer science and employ them in applied fields and prepare students to be specialists in this vital field to serve our beloved country in all sectors that need this important specialization. The department grants bachelor's degrees (BSc), diploma (DIP), master's degrees (MSc) and doctorate degrees (PhD) in computer science specializations. Since the beginning of the establishment of the department, its most important goals have been to work towards scientific specialization. Currently, the department grants bachelor's degrees in six specializations: Software, Information Systems, Artificial Intelligence, Computer Security & Cybersecurity, Network Management and Multimedia. Students study the theoretical and applied aspects of these sciences 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 state institutions. It also has a tangible activity with employees in state departments by holding annual specialized courses in computer science. These courses are organized at the Continuing Education Center.

Vision

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 cadres in the field of computer science with undergraduate and graduate degrees.

Mission

The department's message is based on the precise specializations of computer science. 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 line 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).

Objectives

Are to graduate students with the precise specializations of computer science in its precise specialized branches in addition to preparing advanced and specialized cadres 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.

Pioneering Professors

The Department of Computer Science was established at the University of Technology in 1983 by the following professors:

- ✓ Dr. Hassan Laibi Nasser
- ✓ Dr. Abdul Muttalib Ibrahim

Professors who assumed the position of Head of Department:

1) Dr. Hassan Laibi Nasser	1983 - 1984
2) Dr. Abdul Muttalib Ibrahim Al-Shaikhli	1984 - 1985
3) Dr. Khaled Gerges Al-Daimi	1985 - 1986
4) Dr. Muhammad Ali Shalal	1986 - 1988
6) Dr. Janan Abdul Wahab	1988-1999
7) Dr. Abbas Fadhel Abdul Qader	1999-2002
8) Dr. Mazhar Al-Ani	2002-2003
9) Dr. Hilal Hadi Al-Quraishi	2003 - 2012
10) Dr. Imad Kazem Jabbar	2012 - 2013
11) Dr. Abdul Moneim Saleh Rahma	2013 - 2015
12) Dr. Hala Bahjet Abdul Wahab	2015-2019
13) Dr. Alia Karim Abdul Hassan	2019- 2023
14) Dr. Alaa Kazem Farhan	2023- Ongoing

Council of Computer Science Department

1-	Prof. DR. Ala Kadhim Farhan	Faculty dean of Computer science department
2-	Asst. Prof. Dr. Mustafa Jasim Hadi	Assistant dean for Academic Affairs
3-	Asst. Proof. Dar. Bashar Sadan Mahdi	Assistant dean for Administrative Affairs
4-	Prof. Dr. Ahmed T. Sadiq	Faculty Representative
5-	Assoc. Prof. Dr. Ayad Hazim Ibrahim	Head of Software branch
6-	Asst. Prof. Dr. Athraa Jasim Mohammed	Head of Information Systems branch
7-	DR. Dena Kadhim Mohsen	Head of Artificial Intelligence branch
8-	Dr. Rana Mohammed Hassan Zaki	Head of Computer Security and Cyber Security branch
9-	Dr. Saif Bashar Nema	Head of Networks Management branch
10-	Dr. Nada Hussain Ali	Head of Multimedia branch
11-	Dr. Mustafa Tareq	Department decision

Computer Security & Cyber Security Branch

❖ Establishment of the Computer Security Branch

The Computer Security Branch was established in 2004-2005. In 2022-2023, the name of the branch was changed to Computer Security and Cyber Security. The branch graduate works in the field of understanding and developing secure programs and systems, protecting and storing data in a way that cannot be modified by any external party, ensuring its reliability when transferred and preserved, and developing methods of protecting data and its stores from tampering and theft. The Computer Security Branch graduate has experience in understanding and implementing the most important basic

encryption methods and algorithms, as well as in the ability to detect intruders on computer networks and methods of hiding important digital information using texts, images, audio or digital video. The student is also prepared to keep pace with technological development and reduce electronic crimes, as well as comprehending and understanding legal, professional, technical and ethical responsibilities. The Computer Security Branch is keen to keep pace with the latest developments in the field of computer security. It also has a major and important role in consulting with state institutions and working together with them in the field of information security and cyber security and developing state cadres in these fields. Accordingly, the branch makes every effort to develop all faculty members, educational resources, research and curricula. The branch also works with all available capabilities to meet the needs of local and regional markets by graduating students who are properly trained to serve their community. These graduates will have the ability to obtain a career future specializing in computer security, relying on the extensive scientific knowledge acquired in the basics of computer science, information security and networks, in addition to the ability of graduate students to pursue postgraduate studies and choose research fields that keep pace with the rapid development in the field of computer security.

Vision

The branch seeks to qualify highly qualified graduates in the field of computer security and cyber security who possess the cognitive skills in applying data and information security protection methods and transferring academic knowledge to the labor market and providing the private and public sectors with scientific technical cadres in this field.

Mission

The branch seeks to prepare distinguished cadres in the field of computer security and cyber security and develop information and data security skills by developing learning skills for the branch staff and students and developing learning vocabulary to serve the needs of work.

Objectives

- Applying strategies and technical skills to ensure data and information protection.
- Studying commitment to ethical behavior in the field of information security.
- Applying the principles of scientific and systematic thinking to solve problems and challenges of digital and cyber information security.
- Mastering the skills necessary for the student to move to the stage of specialization in computer and information security.

Graduate Specifications

Computer Security and Cybersecurity graduate specifications vary to include a range of technical and administrative skills and knowledge. The most prominent specifications include: the ability to detect and assess threats, critical thinking and problem solving, encryption and data protection skills, experience in managing security systems.

Graduate Work Areas

Computer Security and Cybersecurity graduates have multiple job opportunities in different fields due to the increasing demand for specialists in this field. The most prominent work areas include (network security, information security management, penetration analysis and testing, data encryption, cloud security).

Computer Security and Cybersecurity Branch Council

1) Asst. Dr. Rana Mohamed Hassan Zaki Chairman

2) Asst. Lecturer. Asmaa Rashid Salman Rapporteur

3) Prof. Dr. Hala Bahjat Abdel Wahab Member

4) Prof. Dr. Sakina Hashem Hassan Member

5) Prof. Dr. Alaa Kazem Farhan Member

6) Prof. Dr. Nidaa Falih Hassan Member

7) Asst. Dr. Abeer Tariq Mawloud Member

8) Asst. Dr. Ikhlas Khalaf Kabashi Member

Scientific Committee of the Computer Security &Cybersecurity Branch

1) Hala Bahjat Abdel Wahab	Chairman
2) Prof. Dr. Nidaa Falih Hassan	Member
3) Prof. Dr. Abeer Tariq Mawloud	Member
4) Asst. Prof. Dr. Noha Gam	Member
5) Prof. Dr. Ikhlas Khalaf Kabashi	Member and Rapporteur

Educational Guidance Committee

1) Asst. Prof. Dr. Sakina Hassan Hashem	Chairman
2) Asst. Prof. Alaa Nouri Mazhar	Member
3) Asst. Prof. Zaid Khadir Hussein	Member

Bologna Process Committee

1) Asst. Prof. Dr. Rana Mohammed Hassan	Chairman
2) Asst. Dr. Enaam Sakr Nasser	Member
3) Asst. Prof. Asmaa Rashid Salman	Member
4) Eng. Rasha Ismail Ahmed	Member and Rapporteur

Required learning outcomes, teaching and learning methods and assessment

1. Knowledge and understanding

- Helps the student understand and develop secure programs and systems.
- The student is able to encrypt and analyze the code for any system.
- The student is able to detect intruders on networks or computers as well as protect data and its stores from tampering and eavesdropping.
- Helps the student to carry out simplified scientific and practical projects that demonstrate the extent of his comprehension as well as its practical application

2. Subject-specific skills

- Enables the student to encrypt or hide any information he wants.
- Enables the student to develop encryption algorithms or invent a new algorithm and form research on this topic.
- Enables the student to develop methods of protecting computers and networks from hacking and detecting intruders.

3. Evaluation methods

Students are evaluated on the basis of Examination, Quizzes, homework, as well as simplified application projects that demonstrate the extent of the student's understanding of the material as well as the extent of benefit from it.

4. Emotional and value-based objectives

- The student carries out simplified projects that increase his ability to think and be aware.
- Urge students to present new ideas that have not been used before.
- Hold a discussion session between students and express their opinions and ideas and work together to develop a specific idea for the better

5. Teaching and learning methods

Students are informed of previous ideas and achievements made by specific people or previous students who have obtained satisfactory and effective results in practical reality and then students are urged to innovate new ideas and methods or develop a specific method and conduct research, all of which helps the student develop the intellectual and mental level.

6. General and transferable skills (other skills related to employability and personal development)

- Conduct experiments and research as well as create application programs in order to increase the student's ability to think logically and gain experience in order to develop methods of protecting data and computers from tampering and eavesdropping.
- Review previous ideas and algorithms in order to benefit from them and learn how to develop them or do something new, whether in the field of encryption or concealment.

University of Technology - Iraq

Department of Computer Science

Study plan for a bachelor's degree in computer security and cyber security

Semester Academic System

The third and fourth stages in the branch adopt a semester system where the subjects for one stage are divided into two parts and by two semesters for each stage. The courses taken during the semester system of the third and fourth stages are divided into subjects within the requirements of the university, materials within the requirements of the department, and specialized subjects within the requirements of the branch.

Number of semesters for the semester system

The study includes two semesters called the first: the first semester begins according to the university calendar and lasts for 15 weeks and the second is called: the second semester and its beginning is determined by the university calendar and lasts for 15 weeks.

Semester System Subjects Unit

It is a study effort of two hours (theoretically or practically) and is calculated every two or three hours one unit of study and more than that is equal to two units of study and so on. Number of units for semester system subjects In order to obtain a bachelor's degree in computer science, a student must accumulate 132 units during the four academic years.

Bologna Track System for the first and second stages

The first stage in the branch adopts the Bologna system, where the subjects for the first and second stages are divided into two semesters, and the subjects taken during the two semesters of the first stage are divided into subjects within the requirements of the university, materials within the requirements of the department, and specialized materials within the requirements of the branch.

Number of classes for the Bologna Path System

The study within the first and second stages of the Bologna track includes two semesters called the first: the first semester begins according to the university calendar and lasts for 15 weeks and the second is called: the second semester and its beginning is determined according to the university calendar and lasts for 15 weeks.

Module of Bologna Path System Subjects

Each subject has a number of units determined by the scientific department and one unit is equivalent to 25 hours of learning from the student's academic load. Student workload refers to the time it takes for the student to learn in each course, including all activities and assignments that the student achieves inside and outside the classroom.

Number of units for Bologna Track System Materials

In order to obtain a bachelor's degree in computer science, a student must accumulate 240 units during the four academic years.

computer security and cyber security Branch Curriculum for the Academic Year 2024- 2025

First Year – First Semester “Bologna process”

Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	ECTS	Module Type
One	1	PRFU111	Programming Fundamentals	اساسيات البرمجة	English	8.00	B
	2	MATH112	Mathematics	الرياضيات	English	8.00	B
	3	STPR113	Statistics and Probability	الاحصاء والاحتمالات	English	6.00	B
	4	**CYSP114**	**Cyber Security Principles**	**مبادىء الأمن السيبراني**	**English**	**4.00**	**C**
	5	DEHR105	Democracy and Human Rights	الديمقراطية و حقوق الانسان	English	2.00	B
	6	WSHS106	Workshop	المعامل	Arabic	2.00	B
					Total	30.00	

Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	ECTS	Module Type
Two	1	STPR121	Structured Programming	البرمجة المهيكلة	English	8.00	
	2	DIST122	Discrete Structures	الهياكل المتقطعة	English	5.00	B
	3	COLD 123	Computer Organization and Logic Design	تركيب الحاسوب والتصميم المنطقي	English	6.00	B
	4	**COTE124**	**Coding Techniques**	**تقنيات الترميز**	**English**	**4.00**	**C**
	5	**NUTH125**	**Number Theory**	**نظرية الأرقام**	**English**	**5.00**	**C**
	6	WORK106	Workshop	المعامل	Arabic	2.00	B
					Total	30.00	

Second Year – First Semester "Bologna process"

Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	ECTS	Module Type
Third	1	OBOP211	Object Oriented Programming	برمجة شيئية	English	8.00	B
	2	DAST212	Data Structures	هياكل بيانات	English	5.00	B
	3	NUAN213	Numerical Analysis	تحليل عددي	English	5.00	B
	4	**STCI214**	**Stream Cipher**	**التشفير الانسيابي**	**English**	**6.00**	**C**
	5	**AUAC215**	**Authentication and Access Control**	**التخويل والتحكيم بالوصول**	**English**	**4.00**	**C**
	6	CBRI201	Crimes of the Baath Regime in Iraq	جرائم نظام البعث في العراق	Arabic	2.00	B
					Total	30.00	

Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	ECTS	Module Type
four	1	DATA221	Database	قواعد بيانات	English	7.00	
	2	MICR222	Microprocessor	معالجة مايكروية	English	5.00	B
	3	SOSA223	Sorting and Searching Algorithms	خوارزميات البحث والترتيب	English	5.00	B
	4	**BLCI224**	**Block Cipher**	**التشفير الكتلي**	**English**	**5.00**	**C**
	5	**SOSE225**	**Software Security**	**امنية البرامجيات**	**English**	**4.00**	**C**
	6	ENLA207	English Language	اللغة الانكليزية	English	3.00	B
	7	ARLA204	Arabic Language	اللغة العربية	Arabic	3.00	B
					Total	30.00	

Third Stage – First Semester						
	Code	Subject in English	Number of Hours / Week			
			Theory	Lab	Tutorial	Units
1.	CSCL3123	Microprocessor	2	2	1	3
2.	CSCL3125	Computation Theory	2	-	1	2
3.	CSCL3129	Knowledge Representation	2	2	-	3
4.	CSCL3107	Computer Networks 1	2	2	1	3
5.	CSCS3107	Malicious codes	2	-	1	2
6.	CSCS3108	Public Key	2	2	1	3
7.	CSCS3109	Multimedia Fundamentals	2	2	-	3
8.	CSCL3133	English Language 3	2	-	-	2
Total			16	10	5	21

Third Stage – Second Semester						
	Code	Subject in English	Number of Hours / Week			
			Theory	Lab	Tutorial	Units
1.	CSCL3224	Computer Architecture	2	2	1	3
2.	CSCL3226	Compiler Design	2	2	1	3
3.	CSCL3230	Intelligent Searching Techniques	2	2	-	3
4.	CSCS3210	Mobile and network Security	2	-	1	2
5.	CSCS3211	Ethical Hacking	2	-	1	2
6.	CSCS3212	Block Cipher	2	2	1	3
7.	CSCS3213	Multimedia Security	2	2	-	3
8.	Total		14	10	5	19

Fourth Year Syllabus

	Fourth Stage – First Semester					
	Code	Subject in English	Number of Hours / Week			
			Theory	Lab	Tutorial	Units
1.	CSCL4134	Static Web Programming	2	2	1	3
2.	CSCL4136	Operating System 1	2	2	1	3
3.	CSCS4116	Cloud Computing Security	2	-	1	2
4.	CSCS4117	Information Hiding & Watermarking	2	2	1	3
5.	CSCS4118	Advance Cryptography	2	-	-	2
6.	CSCS4119	Intelligent Systems	2	2	1	3
7.	CSCL444	Project	2	2	-	3
Total			14	10	5	19

Fourth Stage – Second Semester						
	Code	Subject in English	Number of Hours / Week			
			Theory	Lab	Tutorial	Units
1.	CSCL4235	Dynamic Web Programming	2	2	1	3
2.	CSCL4237	Operating system 2	2	2	1	3
3.	CSCS4220	Crypt Analysis	2	-	1	2
4.	CSCS4221	Authentication and Access Control	2	_	1	2
5.	CSCS4222	Cyber Security	2	_	_	2
6.	CSCS4223	Soft Computing	2	2	-	3
7.	CSCL4142	English Language 4	2	-	-	2
8.	CSCL444	Project	2	2	-	3
Total			16	8	4	20

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