

**Iraqi Ministry of Higher Education and Scientific Research College of Computer  
Science and Mathematics**

**Software Department**

# **Curriculum Description Manual 2023-2024**

**1.1 Introduction** Software Science is an existing branch of knowledge that focuses on all aspects of the software development life cycle of systems.

Distributed software is extensive and highly complex, and software engineering focuses specifically on programming methodologies, development, software technology tools, software integration and configuration, as well as software automation, testing and software quality technologies.

and reuse and software security aspects.

Where the specialization of software science is one of the most important new disciplines that have emerged on the scientific scene according to the great need in the fields of work of computer specialists, as software engineering specialists do many of the necessary work to ensure the development and construction of software systems, depending on software engineering methodologies and approved standards, and the aim is to verify their good performance and safety from errors. As a result of the tremendous software revolution and the dependence of many institutions of all sizes on software systems, there has become an urgent and severe need in the labor markets for specialists and researchers in the field of software engineering with competence

High ability to analyze complex problems and provide software solutions to them  
Includes potential employers of engineers

Software All software suppliers, Internet-based companies, e-business organizations, research and development laboratories, oil sectors, airlines, government agencies, banks, insurance companies, and other

Commercial and industrial organizations.

Based on the hoped-for role of the University of Mosul / College of Computer Science and Mathematics in the effective contribution to achieving the university's vision

Which depends in achieving its objectives on qualifying distinguished national cadres, the

master's and diploma program in software engineering was opened to be the leading program of its kind at the university level, and a basic tributary for the production of specialized researchers and academics in the field of software engineering and manufacturing. The success of the diploma and Master of Science program in software engineering for the past years has contributed to the acquisition of the necessary expertise and capabilities in order to keep pace with the requirements of the labor market, as well as building the content of the program in line with modern scientific trends in the field of software engineering. In addition, research interests in diploma and master's programs include a variety of topics and problems that are fundamental in software engineering as well as a variety of areas in which software engineering can have important applications. Core topics include software requirements, software architecture, software health testing, software development and maintenance, software repository mining, software use engineering and interaction.

Humans with the computer and so on.

As for potential applications, they include smart software systems, multimedia systems, mobile systems and wide

Spread and others. The PhD program proposed in this document is designed to include these research interests in addition to

New research directions such as research-based software engineering, software analysis, big data, and cloud computing. In general, this program aims to produce leaders in the software industry and researchers specialized in software engineering.

Have high research and academic skills, and individuals who complete this program are able to conduct rigorous research in the field of engineering


software and contribute to the leadership of the software industry sector in Iraq for the coming years.


وزارة التعليم العالي والبحث العلمي  
جهاز الإشراف والتقويم العلمي  
دائرة ضمان الجودة والاعتماد الأكاديمي

## استمارة وصف البرنامج الأكاديمي للكليات والمعاهد للعام الدراسي



الجامعة : الموصل  
الكلية /المعهد : علوم الحاسوب والرياضيات  
القسم العلمي : البرمجيات  
تاريخ ملء الملف :

التوقيع :   
اسم المعاون العلمي : د. د. هـ. حسن  
التاريخ : ٢٠٢٤ / ٢ / ٢١

التوقيع :   
اسم رئيس القسم : أ.م. د. نكتل مؤيد الهبيي  
التاريخ : رئيس القسم  
٢٠٢٤ / ٢ / ٢١

دقق الملف من قبل  
شعبة ضمان الجودة والأداء الجامعي  
اسم مدير شعبة ضمان الجودة والأداء الجامعي :  
التاريخ : / /  
التوقيع :

  
الاستاذ الدكتور  
م. م. السيد  
عميد كلية علوم الحاسوب والرياضيات  
٢٠٢٤ / ٢ / ٢١  
مصادقة السيد العميد

## Academic Program Description

This academic program description provides requisite reviews that inspire the characteristics of the program and the learning consummations expected of the student to achieve confusing us about whether he or she has made the most of the opportunities available. It is accompanied by a description of each course within the program

<b>College of Sciences of Computers and Sportswomen / University of Mosul</b>	1. Educational institution
<b>Faculty of Computer Science Mathematics / Department of Software</b>	2. Scientific Department / Center
<b>Bachelor of Software Science</b>	3. Name of the academic program or Vocational
<b>Bachelor</b>	4. Name of the final certificate
<b>Courses + Boulogne First Stage</b>	5. Academic system : Courses / Annual / Other
<b>Accreditation</b>	6. Accredited Accreditation Program
<b>Central Examinations</b>	7. Other external influences
	8. Date of preparation of the description
9. Objectives of the academic program	

The objectives of the academic program are: **1- Preparing the qualification of specialists to meet the requirements of the labor market in the public and private sectors in software engineering and information technology through diversification in learning and teaching methods and training students to apply the knowledge and skills acquired to solve**

**Realistic problems . 2- Creating the appropriate climate for students to enable them to apply their acquired knowledge and skills in identifying the needs and problems of society and social matters related to software engineering and information technology**

**3-Providing distinguished academic programs in the field of software engineering that heal theoretical and practical applications that comply with quality standards**

**Academics and meeting the need of work - 4 Encouraging and developing scientific research in the fields of software engineering and information technology**

**5.Preparing a stimulating environment for faculty members to develop their knowledge and educational and research skills**

**6-Building and developing partnership with government and civil sectors and society in all its various institutions**

10. Required Program Outcomes and Teaching, Learning and Assessment Methods

A-A Cognitive Objectives.

**A-1 The student should learn programming languages**

**A-2 The ability to find scientific solutions to the problems of society** Software A-3 Develop the student's skills in building smart systems that depend on the basis of analysis and conclusion A-4 Provide the student with the basic rules in building software systems based on the basics of engineering

Software A-5 Increase the student's information on the basics of implementing software systems by understanding the mechanism of computer work

B - Skills objectives of the program:

**B 1 - Theoretical B2 - Practical**

B3 - Summer Internship

B4 - Graduation Research

Teaching and learning methods

**-1Regular board -2 Smart board**

**3. Data display device**

Evaluation methods
<b>1. Central and monthly exams</b> <b>-2daily exams -3scientific reports -4practical exams -5research projects</b>
C- Emotional and value goals: <b>C-1 Deduction and Analysis Skills</b> <b>C-2 Comparative Skills</b> <b>C-3 Discussion Skills</b> <b>C-4 Use of computers and the Internet</b> <b>C.5Research and Investigation C.6Research and Conclusions</b> <b>C.7 Decision Making</b>
Teaching and learning methods
<b>Teaching and Learning Methods -1</b> <b>Theoretical lectures -2 Practical laboratories -3Research</b> <b>Survey 4. Focus groups within practical lessons</b>

Evaluation methods
<b>1. Written Examinations 2.Research Projects</b> <b>3. Summer discussions 4. Evaluation of assignments and discussions 5. Evaluation of individual and group research</b>

d. General and qualifying skills transferred (other skills related to employability and personal development.) <b>D-1 Developing the capacity for effective teamwork D-2 Developing the ability to self-learning D-3 Developing the ability to present and discuss ideas</b> <b>D-4 Develop the ability to address problems in a logical and organized manner</b>
Teaching and learning methods
<b>1. Collaborative Education 2. Group Discussions 3. Individual Education</b>

Evaluation methods				
<b>1- Observing the interaction of students in different situations 2. Raising issues and problems from reality and observing how students deal programmatically with them</b>				
<b>3. Evaluation of group and individual actions 4. Solving summer training problems through graduation projects</b>				
11. Program Architecture				
Credit Hours		Course Name	Course or Course Code	Stage of study
practical	theoretical			
-	1	Democracy and Human Rights	CMSW22F111	First/ First Year Course
2	2	Logical design	CMSW22F112	
2	2	Computer	CMSW22F113	
-	4	Math	CMSW22F114	
-	2	Discontinuous structures	CMSW22F115	
2	2	1-Algorithms and Programmed Structure	CMSW22F116	
2	2	Statistics and Probability	CMSW22F121	/ First Year Second Course
2	2	Computer Systems	CMSW22F122	
2	2	Assembly language	CMSW22F123	
-	4	English	CMSW22F117	
-	2	اللغة العربية	CMSW22F125	
2	2	2-Algorithms and Programmed Structure	CMSW22F126	
-	2	Baath Party Crimes	CMSW22F127	First/ Second Year Course
2	2	the 1- Data structures and algorithms of python language	CMSW22F211	
2	2	(1) Introduction to Software Engineering	CMSW22F212	
2	2	Python(1)(1) Entity Programming in	CMSW22F213	



2	2	(1) Software Systems	CMSW22F214	
2	2	Database Management	CMSW22F215	
2	2	Numerical methods and computer modeling	CMSW22F216	
-	1	Freedoms	CMSW22F217	
-	2	English	CMSW22F218	
2	2	2-python Data structures and algorithms using	CMSW22F221	
2	2	(2) Introduction to Software Engineering	CMSW22F222	
2	2	Python(2)Entity programming in	CMSW22F223	
2	2	(2) Software Systems	CMSW22F224	
2	2	Distributed database design	CMSW22F225	
2	2	Computer Simulation and Modeling	CMSW22F226	
2	2	Artificial Intelligence	CMSW22F311	First/ Third Year Course
2	2	Design of translators	CMSW22F312	
-	2	(1) Software Project Management	CMSW22F313	
2	2	Software requirements	CMSW22F314	
2	2	Computer Architecture	CMSW22F315	
2	2	Computer Networks and the Internet	CMSW22F316	
2	2	File processing	CMSW22F317	
-	2	English language	CMSW22F318	
2	2	Intelligence techniques	CMSW22F321	/ Third Year Second Course
2	2	Software Engineering Tools	CMSW22F322	
-	2	/Software Project Management2	CMSW22F323	
2	2	Software tolerance for errors	CMSW22F324	
2	2	Operating Systems	CMSW22F325	
2	2	Website Engineering	CMSW22F326	
2	2	Teaching methods	CMSW22F327	
2	2	Information Security	CMSW22F411	/ Fourth Year First Course
-	2	Software Development Techniques	CMSW22F412	
2	2	(1)Image Processing & Signal	CMSW22F413	
-	2	Software reliability	CMSW22F414	
2	2	(1) Real Time Systems Design	CMSW22F415	
-	2	English language	CMSW22F416	

4	1	(1) Graduation Project	CMSW22F417	<b>/ Fourth Year Second Course</b>
2	2	Computer Network Security	CMSW22F421	
-	2	Software Quality Assurance	CMSW22F422	
2	2	(2)Image and Signal Processing	CMSW22F423	
2	2	Open Source Software	CMSW22F424	
2	2	/Design of real-time systems2	CMSW22F425	
4	1	(2) Graduation Project	CMSW22F426	

12. Planning for personal development

**-1 Through the scientific conference for students -2 Quarterly scientific symposium of the department -3 seminars for professors**

**-4 seminars**

13. Admission criterion (setting regulations related to admission to the college or institute)

**According to the controls set by the Ministry of Higher Education and through the central admission, the admission controls approved by the university and the college according to the student's desire**

**For progression in the department.**

14. Main sources of information about the program

**Methodological books / professors**

Curriculum Skills Outline																			
Please tick the boxes corresponding to the individual learning outcomes from the program under evaluation.																			
Learning outcomes required from the program																			
General and qualifying skills transferred (other skills related to the ability of Employment and Personal Development)				Emotional and value goals				Program Skills Objectives				Knowledge Objectives				Basic or optional	Course Name	Course Code	Year / Level
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundamental	Al-Deim Quratiyyah and The Rights of Insaan	CMSW22F111	year first First course
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundamental	Logical design	CMSW22F112	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundamental	Computer	CMSW22F113	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	Sasi	Rayadiyat	CMSW22F114	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundamental	Discontinuous structures	CMSW22F115	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundamental	1-Automated Algorithms and Structuring	CMSW22F116	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundam	اللغة الانكليزية	CMSW22F117	

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√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundam ental	Al-Ahsa wa'l-Ihtumiyah	CMSW22F121	/ First Year Second Course
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundam ental	Computer organization	CMSW22F122	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundam ental	Community Language	CMSW22F123	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundam ental	(2) Rhysian Rhysiod	CMSW22F124	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundam ental	Computational theory	CMSW22F125	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundam ental	2-Automated Algorithms and Structuring	CMSW22F126	

√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	اللغة العربية	CMSW22F127	/ Second Year First Course
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	1-python language algorithms Datanet structures and	CMSW22F211	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	(1) Introduction to Pragmatic Engineering	CMSW22F212	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Python (1) Kenyan skull in	CMSW22F213	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	(1) Rigid Systems	CMSW22F214	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Manage Bayant rules	CMSW22F215	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Numerical methods and computer modeling	CMSW22F216	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	I hurried	CMSW22F217	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	English	CMSW22F218	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Language Algorithms Python-2 & BIA Structures	CMSW22F221	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	(2) Introduction to Pragmatic Engineering	CMSW22F222	/ Second Year Second Course
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Python (2) Kian skull in	CMSW22F223	

√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	(2) Rigid Systems	CMSW22F224		
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Design distributed databases	CMSW22F225		
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Protectors and models of Ahlasop	CMSW22F226		
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Artificial Intelligence	CMSW22F311	third year first/ course	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Design of revillors	CMSW22F312		
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	(1) Pragmiyat Project Management	CMSW22F313		
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Requirements for Arbajins	CMSW22F314		
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Architecture Ahlasoub	CMSW22F315		
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Ahlasop networks and the Internet	CMSW22F316		

√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Processing files	CMSW22F317	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	English language	CMSW22F318	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Intelligence techniques	CMSW22F321	/ Third Year Second Course
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Software Engineering Tools	CMSW22F322	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	(2)Pragmiyat Project Management	CMSW22F323	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	معالجة الريمجان للاخطا،	CMSW22F324	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Operating Systems	CMSW22F325	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Website Engineering	CMSW22F326	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Teaching methods	CMSW22F327	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Information Security	CMSW22F411	/ Fourth Year First Course
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Techniques for developing Robotics	CMSW22F412	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	(1) Image & Signal Processing	CMSW22F413	



√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	Sasi	Reliability of Rboms	CMSW22F414
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	(1) Annular Time Systems Design	CMSW22F415
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	English language	CMSW22F416
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	(1) Khatarj Project	CMSW22F417
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Ahlasop network security	CMSW22F421
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	Quality Assurance	CMSW22F422
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundame ntal	(2) Image and Signal Processing	CMSW22F423
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	basic	Opened Chests	CMSW22F424
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundam ental	(2) Design of real-time systems	CMSW22F425
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	fundam ental	(2) Khatrej Project	CMSW22F426

/ Fourth Year  
Second  
Course