

University of Baghdad
جامعة بغداد



First Cycle – Bachelor's Degree (B.Sc.) – Data Science
بكالوريوس – علم البيانات



جدول المحتويات | Table of Contents

1. Mission & Vision Statement	بيان المهمة والرؤية
2. Program Specification	مواصفات البرنامج
3. Program (Objectives) Goals	أهداف البرنامج
4. Program Student learning outcomes	مخرجات تعلم الطالب
5. Academic Staff	الهيئة التدريسية
6. Credits, Grading and GPA	الاعتمادات والدرجات والمعدل التراكمي
7. Modules	المواد الدراسية
8. Contact	اتصال

1. **Mission & Vision Statement**

Mission:

The program aims to equip students with strong analytical, computational, and problem-solving skills to transform data into actionable insights. Through a combination of theoretical knowledge and practical applications, students will develop expertise in data analysis, machine learning, and big data technologies to address complex problems across various industries.

Vision:

To be a leading academic program in data science that fosters innovation, analytical thinking, and the application of data-driven solutions to real world challenges.

2. Program Specification

Programme code:	BSc-DC	ECTS	240
Duration:	4 levels, 8 Semesters	Method of Attendance:	Full Time

A Bachelor of Science (B.Sc.) degree program in Data Science (DS) typically provides students with a comprehensive understanding of the principles and applications of remote sensing and GIS technologies. The program combines theoretical knowledge with practical skills to enable students to analyze, interpret and manage data effectively.

The program usually takes four years to complete and involves coursework, laboratory exercises, and fieldwork. The specific courses and requirements may vary depending on the institution offering the program, but the following are some of the common features of a B.Sc. in DS:

1. Core Courses: These courses provide students with a foundation in the fundamental principles of remote sensing and GIS. Topics covered may include cartography, spatial analysis, data visualization, remote sensing data acquisition and processing, image analysis, and GIS data management.
3. Elective Courses: Students are often allowed to choose from a range of elective courses to tailor their education to their areas of interest. These courses may include topics such as environmental modeling, geostatistics, database design, and web GIS.
4. Laboratory Exercises: Laboratory exercises are essential in developing practical skills. Students work with software and hardware tools to manipulate and analyze spatial data. They also learn how to use equipment such as GPS, drones, and remote sensing sensors.
5. Fieldwork: Fieldwork is an important aspect of the program, as it exposes students to real-world scenarios and helps them understand how to apply their theoretical knowledge in practical situations. Fieldwork may involve collecting data, conducting surveys, or analyzing existing spatial datasets.
6. Capstone Project: In their final year, students may be required to undertake a capstone project that allows them to apply their knowledge and skills to a real-world problem. The project may involve designing a GIS database, developing a remote sensing application, or conducting a spatial analysis of a specific area.

Graduates of a B.Sc. in Remote Sensing and GIS program are typically well-prepared for careers in a range of fields, including environmental management, urban planning, natural resource management, and disaster response. They can also pursue further studies in related fields such as geography, geology, or environmental science.

7. Program Objectives

The DS Program at COE expects its graduates to achieve the following outcomes within a few years after graduation:

1. Design effective data science (DS) solutions and apply DS principles in practical settings.
2. Lead, collaborate, and communicate effectively within cross-functional teams.
3. Conduct themselves according to high ethical standards.
4. Secure employment with skilled managers and professionals in data-driven industries or gain acceptance into graduate programs.
5. Enhance their knowledge and skills through continuing education or lifelong learning opportunities.
6. Contribute to their communities at local, national, or global levels.

8. Student Learning Outcomes

Upon graduation, students from the DS program are expected to showcase a range of practical abilities, including:

1. applied competence in analyzing, interpreting, and understanding data science development processes, principles, and methods to create solutions that meet specified needs, considering a robust digital ecosystem, public health, safety, welfare, and various global, cultural, social, environmental, and economic factors.
2. ability to communicate effectively with diverse audiences. This focus on communication skills ensures that our students can effectively convey their ideas and solutions to various stakeholders.
3. ability to work effectively as part of a team, provide leadership, foster a collaborative and inclusive environment, establish goals, plan tasks, and achieve objectives. This emphasis on teamwork ensures that our students are skilled individuals and effective team players.
4. ability to develop and conduct appropriate experiments and analyze and interpret data to conclude.
5. ability to recognize ethical and professional responsibilities in data analysis and make informed judgments, considering the impact of digital solutions in global, economic, environmental, and societal contexts.
6. The ability to acquire and apply new knowledge as needed, utilizing appropriate learning strategies.
8. A willingness to assume leadership roles and responsibilities in a range of fields.

9. Academic Staff

10. Credits, Grading and GPA

Credits

(Name) University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

CGPA of a 4-year B.Sc. degree:

$$CGPA = [(1^{st} \text{ module score} \times ECTS) + (2^{nd} \text{ module score} \times ECTS) +] / 240$$

11. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
GEN 101	Introduction to Programming	94	81	7.00	C	
GEN 102	Mathematics 1	63	112	7.00	C	
GEN 103	critical thinking	64	86	6.00	C	

DS 101	Introduction of Data Science	94	56	6.00	B	
UOB101	Arabic Language I	33	17	2.00	B	
UOB104	Democracy and Human Rights	33	17	2.00	B	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
GEN 113	Statistics	79	96	7.00	C	
GEN 112	Writing skills	33	67	4.00	B	
DS 111	Fundamentals of AI	63	87	6.00	C	
DS 112	Fundamentals of Database Management	63	112	7.00	C	
UOB102	English Language I	33	42	3.00	B	
UOB103	Computer I	49	26	3.00	B	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
DS 201	Applied Statistics	93	82	7.00	C	
DS 202	Programming Methodology	93	82	7.00	C	
GEN 205	Entrepreneurship	33	92	5.00	B	
E-DS 203	Elective201	48	77	5.00	C	
UOB105	Baath Regime Crimes in Iraq	33	42	3.00	B	
UOB203	Computer II	48	27	3.00	B	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
DS 211	Introduction to Optimization: Data Science	93	82	7.00	C	
DS 212	Data Structures and Algorithms	93	82	7.00	C	
DS 213	Linear algebra	63	62	5.00	C	

E-DS 214	Elective211	48	77	5.00	C	
UOB201	Arabic Language II	33	42	3.00	B	
UOB202	English Language II	33	42	3.00	B	

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
DS 301	Machine Learning	93	57	6.00	C	
DS 302	Data Mining	93	57	6.00	C	
DS 303	Big Data Analytics	93	57	6.00	C	
DS 304	Decision Making and Data Science	63	62	5.00	C	
DS 305	Data Privacy and Ethics	48	2	2.00	C	
E-DS 305	Elective301	48	77	5.00	C	

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
DS 311	Digital Project Management	93	57	6.00	C	
DS 312	Climate Models and Data	63	87	6.00	C	
DS 313	Biostatistics	63	87	6.00	C	
DS 314	Data Science Practicum I	93	57	6.00	C	

E-DS 315	Elective311	48	77	5.00	C	
UOB309	Scientific Research Methodology	18	7	1.00	B	

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
DS 401	Artificial Intelligence and Its Applications	63	87	6.00	C	
DS 402	From Languages to Machine Learning	63	62	5.00	C	
DS 403	Cloud Computing for Data	63	87	6.00	C	
DS 404	Text Data Analysis	63	62	5.00	C	
E-DS 404	Elective401	48	77	5.00	C	
DS 405	Research Project I	32	43	3.00	C	

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
DS 411	Forecasting Method	93	107	8.00	C	
DS 412	Cyber Security	93	82	7.00	C	
DS 413	AI Safety	63	112	7.00	C	

E-DS 414	Elective411	48	77	5.00	C	
DS 415	Research Project II	32	43	3.00	C	

12. **Contact**