

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

## استمارة وصف البرنامج الأكاديمي للكليات والمعاهد

الجامعة : الانبار

الكلية/ المعهد: علوم الحاسوب وتكنولوجيا المعلومات

القسم العلمي : الذكاء الاصطناعي

تاريخ ملء الملف :

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التاريخ : ٢٠٢٤/٤/١٤

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التاريخ : ٢٠٢٤/٤/١٧

التوقيع :

مصادقة السيد العميد

# University of Anbar



*First Cycle – Bachelor's degree (B.Sc.) – Artificial Intelligence*

الذكاء الاصطناعي – بكالوريوس



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### الرؤية والرسالة

#### ❖ الرؤية

ان رؤية قسم الذكاء الاصطناعي هو استخدام تقنيات الذكاء الاصطناعي لتحويل الصناعات والمجتمعات وحياة الأفراد بشكل إيجابي. إنه يطمح أن يكون مركزًا عالميًا معترفًا به في مجال التعليم والبحث في الذكاء الاصطناعي، حيث ينتج خريجين ليس فقط ماهرين تقنيًا ولكن أيضًا يدركون بعمق الآثار الأخلاقية والاجتماعية والبيئية للذكاء الاصطناعي. من خلال العمل، يسعى القسم إلى تشكيل المشهد في مجال الذكاء الاصطناعي، ودفع الابتكار والشمولية والاستدامة في تطوير ونشر الذكاء الاصطناعي، وفي النهاية، تحقيق تأثير إيجابي دائم على العالم.

#### ❖ الرسالة

ان مهمة قسم الذكاء الاصطناعي هي تعليم وتحفيز وتمكين الجيل القادم من المحترفين في مجال الذكاء الاصطناعي. يلتزم قسم الذكاء الاصطناعي بتوفير تعليم شامل وحديث في مجال الذكاء الاصطناعي، وتعزيز البحث والابتكار، وتعزيز الممارسات الأخلاقية والمسؤولية في مجال الذكاء الاصطناعي. الهدف هو تأهيل الطلاب لتفوق في مجالات ذات صلة بالذكاء الاصطناعي، والمساهمة في تقدم تقنية الذكاء الاصطناعي، ومواجهة التحديات الحقيقية في العالم بحلول ذكاء اصطناعية مبتكرة.

## • مواصفات البرنامج

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

هذا البرنامج يوفر تدريباً تعليمياً وعملياً شاملاً في مختلف جوانب الذكاء الاصطناعي. يركز البرنامج على المبادئ الأساسية للذكاء الاصطناعي، بما في ذلك لغات البرمجة، وقاعدة المعرفة، وهياكل البيانات، وخوارزميات الذكاء الاصطناعي، وهندسة الحواسيب، ومشاكل الأمثلية، والروبوتات، والتعرف على الأنماط. تشكل هذه المواضيع الأساسية أساساً لفهم وحل المشاكل الحسابية المعقدة.

يتعرض الطلاب في المستوى 1 لأساسيات الحوسبة، مما يسمح بالتقدم إلى المواضيع المتخصصة في هذا البرنامج. يتم تغطية المواضيع الأساسية الخاصة بالبرنامج في المستوى 2 تمهيداً لوحدة دراسية متخصصة قادمة بناءً على البحث في المستويات 3 و 4.

في المستويات 2 و 3 و 4، يتمكن الطلاب من اختيار بعض نقاط الوحدات التعليمية الخاصة بهم مع توفير مجموعة متنوعة من الوحدات التي تعكس جوانب الذكاء الاصطناعي، من خلال تحليل المشاكل وصولاً إلى مرحلة توفير الحلول لضمان العرض الشامل للمعرفة المتوقعة من خريج بدرجة الذكاء الاصطناعي. يسمح هذا للطلاب بتطوير اهتماماتهم الواسعة في علوم الحاسوب. يتم اتخاذ القرارات حول ما يجب دراسته بالاستفادة من آراء المعلمين الشخصيين.

تطوير الروح البحثية يتم بدءاً من البداية من خلال الدروس العملية، التي تكون إما مدمجة في وحدات الدروس أو تدرس في وحدات عملية مخصصة، وندوات البحث والدروس التعليمية. في المستوى 4، يقوم جميع الطلاب بتنفيذ مشروع بحث مستقل.

يُعدّ الدروس الأكاديمية في المستويات 1 و 2 مع نفس المعلم، الذي يكون أيضاً المعلم الشخصي، مما يوفر استمرارية وتوجيه تدريجي. تشمل الدروس في المستويات 1 و 2 عددًا من ورش العمل لتعليم المهارات، مثل استخدام المكتبة ومهارات العرض، تليها تمارين تقييمية، مثل المقالات والمحادثات، كفرص لممارسة هذه المهارات في سياق متخصص. يمكن لخريجي البرنامج متابعة مسارات مهنية في تطوير البرمجيات، وتحليل البيانات، وأمن المعلومات، والذكاء الاصطناعي، وتحليل الأنظمة، والبحث، أو متابعة التعليم العالي على مستوى الدراسات العليا.

## • أهداف البرنامج

- تزويد الطلاب بأساس قوي في نظرية وتطبيق الذكاء الاصطناعي.
- تعزيز التفكير النقدي ومهارات حل المشكلات ذات الصلة بالذكاء الاصطناعي.
- غرس الاعتبارات الأخلاقية وتطوير الذكاء الاصطناعي المسؤول.
- تشجيع التعاون والابتكار العابر للتخصصات.
- تهيئة الطلاب لمسارات مهنية في البحث والتطوير والتطبيقات المتعلقة بالذكاء الاصطناعي.

## Student Learning Outcomes

نتائج تعلم الطلاب لقسم الذكاء الاصطناعي تحدد المعرفة والمهارات والكفاءات الخاصة التي يجب أن يكتسبها الطلاب خلال رحلتهم الأكاديمية في مجال الذكاء الاصطناعي. تعتبر هذه النتائج دليلاً لتطوير المنهج الدراسي والتقييم.

عند اكتمال البرنامج، سيكون الطلاب قادرين على:

- أن يكون الطالب قادراً على بناء البرامج والأنظمة الذكية بلغات البرمجة الحديثة.
- أن يكون الطالب قادراً على فهم أنظمة الذكاء الاصطناعي الحديثة وآلية عملها.
- أن يكون الطالب قادراً على بناء أنظمة ذكية قادرة على حل المشكلات الواقعية.
- أن يكون الطالب قادراً على تطبيق خوارزميات الذكاء الاصطناعي.
- أن يكون الطالب قادراً على فهم المبادئ الأساسية في الرياضيات التطبيقية والتحليل العددي.
- أن يكون الطالب قادراً على إظهار مهارات التفكير النقدي في تحليل وحل المشكلات المتعلقة بالذكاء الاصطناعي.
- أن يكون الطالب قادراً على الإبداع والابتكار والبحث العلمي.
- أن يكون الطالب قادراً على فهم الآثار الأخلاقية لتقنيات الذكاء الاصطناعي.

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### ● الساعات المعتمدة، التقييم، ومعدل النقاط التراكمي (GPA)

#### Credits

جامعة الأنبار تتبع عملية بولونيا مع نظام الائتمان لنقل الدرجات الأوروبي (ECTS) إجمالي عدد الساعات المعتمدة في البرنامج الدراسي هو ECTS240 ، بمعدل ECTS 30 لكل فصل دراسي. 1 ECTS يعادل 25 ساعة من عبء العمل الطلابي، بما في ذلك العبء المنظم وغير المنظم.

#### Grading

قبل التقييم، يتم تقسيم النتائج إلى مجموعتين فرعيتين: نجاح وفشل. لذلك، تكون النتائج مستقلة عن الطلاب الذين فشلوا في دورة معينة. يُحدد نظام التقييم على النحو التالي:

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:				

الأعداد العشرية فوق أو تحت 0.5 سيتم تقريبها إلى أقرب عدد صحيح (على سبيل المثال، سيتم تقريب العلامة 54.5 إلى 55، بينما سيتم تقريب العلامة 54.4 إلى 54). الجامعة لديها سياسة عدم التسامح مع "الفشل القريب من النجاح"، لذلك سيكون التعديل الوحيد على العلامات التي تم منحها من قبل المقيم (المقيمين) الأصليين هو التقريب التلقائي المذكور أعلاه.

### 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:

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

### المواد الدراسية

#### Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
AIDC113	Computer Technology	78	47	5.00	C	None
AIDC112	Programming Basics	123	102	9.00	C	None
AIDC111	Introduction to Artificial Intelligence (AI)	93	57	6.00	C	None
CCIT060	Mathematics	93	57	6.00	B	None
UOA003	English Language I	33	17	2.00	S	None
UOA005	Democracy & Human Rights	33	17	2.00	S	None

#### Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
CCIT061	Discrete Structures	78	47	5.00	B	CCIT060
AIDC123	Structured Programming	123	102	9.00	C	AIDC112
AIDC124	Logic Design	93	57	6.00	C	
AIDC125	Data Science	93	57	6.00	C	AIDC111
UOA001	Arabic Language	33	17	2.00	S	
UOA006	The crimes of the defunct Ba'ath party	33	17	2.00	S	

#### Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
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AIDC210	Knowledge Representation	93	57	6.00	C	AIDC125
CCIT062	Numerical Analysis	78	47	5.00	B	CCIT061
AIDC213	Basics of Object Oriented Programming	108	67	7.00	C	AIDC123
AIDC212	Computational Theory	78	47	5.00	C	
AIDC214	Python Programming Language	78	47	5.00	C	AIDC123
UOA002	Arabic Language II	33	17	2.00	S	UOA001

**Semester 4 | 30 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
AIDC222	Advanced Object Oriented Programming	123	77	8.00	C	AIDC213
AIDC223	Algorithms and Data Structures	108	67	7.00	C	AIDC123
AIDC224	Machine Learning Basics	93	57	6.00	C	AIDC214
AIDC225	Artificial Intelligence Algorithms	93	82	7.00	C	AIDC210
UOA002	English Language II	33	17	2.00	S	UOA003

**Semester 5 | 30 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
AIDC311	Compilers	63	62	5.00	C	
AIDC312	Computer Architecture	63	37	4.00	C	AIDC113
CCIT063	Computer Networks	93	57	6.00	B	
AIDC314	Optimization Problems	78	72	6.00	C	AIDC225
AIDC315	Web Applications	63	37	4.00	C	
AIDC316	Advance Machine Learning	93	32	5.00	C	AIDC224

**Semester 6 | 30 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
AIDC321	Information Retrieval	90	35	5.00	C	AIDC214, AIDC223
AIDC322	Databases	93	57	6.00	C	
AIDC323	Metaheuristic	108	67	7.00	C	AIDC225
AIDC324	Deep Learning	108	67	7.00	C	AIDC316



AIDC1325	Computer Security	78	47	5.00	C	
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**Semester 7 | 30 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
AIDC411	Operating Systems	108	42	6.00	C	
AIDC412	Data Mining	108	67	7.00	C	AIDC324, AIDC214
AIDE413	Games Development	93	57	6.00	E	
UOA019	Research Methodology	63	37	4.00	S	
AIDC415	Robotics	108	67	7.00	C	

**Semester 8 | 30 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
AIDC421	Natural Languages Processing (NLP)	78	47	5.00	C	AIDC321, AIDC214
AIDS422	Digital Forensics	78	22	4.00	C	
AIDC423	Pattern Recognition	78	47	5.00	C	AIDC324
AIDC424	Big Data	63	37	4.00	C	
AIDC425	Recommendation Systems	63	37	4.00	C	
UOA020	Project	93	107	8.00	S	UOA019

وسائل الاتصال •

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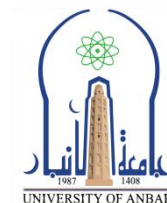
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# University of Anbar جامعة الانبار



*First Cycle – Bachelor's Degree (B.Sc.) – Artificial Intelligence*

بكالوريوس – الذكاء الاصطناعي



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1. Overview
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### 1. Overview

This catalogue is about the courses (modules) given by the program of Artificial Intelligence to gain the Bachelor of Science degree. The program delivers (46) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

#### النظرة العامة

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج الذكاء الاصطناعي للحصول على درجة بكالوريوس في الذكاء الاصطناعي. يقدم البرنامج (46) مادة دراسية، مع (6000) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

### 2. Undergraduate Courses 2023-2024

#### Module 1

Code	Course/Module Title	ECTS	Semester
AIDC113	Computer Technology	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	47
Description			
<p>This module cover computer systems and includes all hardware, software, and Electronic Data. Additionally, The course addresses the principles of modern computing technology, its role in helping to solve real-world problems and the critical issues affecting management. <b>After completing the module</b>, the student should be able to:</p> <ol style="list-style-type: none"><li>1. The student should understand the architecture of any IT systems.</li><li>2. The student should understand the parts of hardware.</li><li>3. The student should understand the system software.</li><li>4. The student should understand the architecture of networks ,protocols and communications devices.</li></ol>			

#### Module 2

Code	Course/Module Title	ECTS	Semester
AIDC112	Programming Basics	9	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)

3	5	123	102
<b>Description</b>			
<p>This module provides an overview of programming languages; and explains the principles of abstraction and modularity. The elements of structured programming are then given before outlining the steps in program design and execution. An introduction to the C++ programming language follows with how to use and apply operators and control statements.</p> <p><b>After completing the module,</b> the student should be able to develop proficiency in the C++ programming language, including a strong understanding of its syntax, semantics, data types, control structures, functions, and object-oriented programming concepts.</p>			

### Module 3

Code	Course/Module Title	ECTS	Semester
AIDC111	Introduction to Artificial Intelligence (AI)	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	93	57
<b>Description</b>			
<p>The aim of this module is to provide an introduction to Artificial Intelligence (AI) and its various applications. Students will gain a comprehensive understanding of the fundamental concepts, techniques, and algorithms used in AI, as well as the ethical considerations associated with its use. The module will also explore the impact of AI on society, economy, and various industries.</p> <p>By the end of this module, students are expected to:</p> <ol style="list-style-type: none"> <li>1. Understand the basic concepts and principles of Artificial Intelligence.</li> <li>2. Gain knowledge of various AI techniques and algorithms.</li> <li>3. Develop an understanding of the ethical implications of AI.</li> <li>4. Analyze the impact of AI on different aspects of society and industry.</li> <li>5. Apply AI techniques to solve real-world problems.</li> </ol>			

### Module 4

Code	Course/Module Title	ECTS	Semester
CCIT060	Mathematics	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	93	57
<b>Description</b>			

This module aims to provide students with a solid foundation of core mathematical concepts and theories. This includes topics such as algebra, calculus, geometry, discrete mathematics, probability, and statistics. The aim is to ensure that students have a comprehensive understanding of fundamental mathematical principles.

**After completing the module,** the student should be able to:

1. Understand and use basic mathematical terminology.
2. Understand the role of formal definitions and proofs and be able to apply them in problem solving.
3. Understand the basics of propositional and predicate logic.
4. Understand the basics of elementary set theory.
5. Understand the basics of mathematical relations and functions.
6. Understand the basics of graph theory.

### Module 5

Code	Course/Module Title	ECTS	Semester
UOA003	English Language I	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0	33	17
Description			
This module focuses on developing the specific skills required for academic studies and exploring strategies for success in academic. New texts, topics, and design, integrated-skills syllabus with a clear grammar focus, new version of Headway iTools – whole book onscreen, Headway iTutor – new interactive self-study DVD-ROM, included with the Student's Book.			

### Module 6

Code	Course/Module Title	ECTS	Semester
UOA005	Democracy & Human Rights	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0	33	17
Description			
<p>تهدف هذه المادة الى تعليم الطلبة على أساسيات حقوق الإنسان وقوانينها والتعرف على الحقوق والحريات وأهم الإشكاليات والتحديات التي تواجهها. اخذ مفردات هذه المادة تساعد على:</p> <ol style="list-style-type: none"> <li>1- أن يعرف الطالب مفهوم الحقوق وقوانينها وتطبيقاتها .</li> <li>2- أن يعرف الطالب كيفية المشاركة في نشر الحقوق وتطبيقها بالعمل الواقعي الحقيقي .</li> <li>3- القدرة على استخدام الحقوق والحريات وسيلة من أجل التعايش السلمي بين مكونات المجتمع وجميع المخلوقات .</li> <li>4- القدرة على مشاركة الآخرين في نشر هذه الحقوق والحريات .</li> </ol>			

**Module 7**

Code	Course/Module Title	ECTS	Semester
CCIT061	Discrete Structures	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	47
Description			
<p>The model of discrete structures aims to study the objects that have discrete as opposed to continuous values including the foundations of logic, algorithms and their complexity, mathematical reasoning, relations, graphs, trees and combinatorics. More precisely:</p> <ol style="list-style-type: none"> <li>1- To Describe the aim of study discrete mathematics</li> <li>2- To Understand what difference between ordinary math and discrete math.</li> <li>3- To Understand what the relation between computer science and math</li> <li>4- To Learn the operation between the difference objects of math.</li> <li>5- To Apply the relation between this objects</li> </ol>			

**Module 8**

Code	Course/Module Title	ECTS	Semester
AIDC123	Structured Programming	9	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	5	123	102
Description			
<p>Learn how to use the Advanced Tools helps programmers write fast, portable programs. The main principles of programming and the development of programming languages Learn the principles of Structure programming.</p> <ul style="list-style-type: none"> <li>• Learn the algorithms</li> <li>• Learn the Flowchart</li> <li>• Learn C++ Programming</li> </ul>			

**Module 9**

Code	Course/Module Title	ECTS	Semester
AIDC124	Logic Design	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	4	93	57

Description
<p>This module demonstrates a solid understanding of digital logic principles, including Boolean algebra, logic gates, truth tables, and the concept of binary representation.</p> <p><b>After completing the module,</b> the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Understand number systems and codes and conversion between them.</li> <li>2. Understand the Boolean expression and how to apply it.</li> <li>3. Recognize among different logic gates and how to use them.</li> <li>4. Understand how to design a logic circuit.</li> <li>5. Understand using K-map for simplification.</li> </ol>

#### Module 10

Code	Course/Module Title	ECTS	Semester
AIDC125	Data Science	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	4	93	57
Description			
<p>This course has been designed to help learners to understand the core concepts and applications of Data Science and Familiarize them with essential data manipulation and visualization techniques. Various data sources and collection methods will be explored in this course to enable learners develop skills in data cleaning and preprocessing. It is anticipated that learners, at the end of this course, will be able to effectively communicate data insights and build data narratives by creating reports and visualizations for data communication.</p>			

#### Module 11

Code	Course/Module Title	ECTS	Semester
UOA001	Arabic Language I	2	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0	33	17
Description			
<p>تهدف هذه المادة الى:</p> <ol style="list-style-type: none"> <li>1. تعليم الطلبة على أساسيات اللغة العربية وقواعدها</li> <li>2. تعليم الطلبة على كيفية الاعراب</li> <li>3. أن يتعرف الطالب على قواعد اللغة العربية</li> <li>4. أن يعرف الطالب كيفية بناء الجمل واستخراجها للعنوان المطلوب</li> <li>5. القدرة على استعمال العبارات الصحيحة</li> <li>6. القدرة على مشاركة الاخرين في الحوار الصحيح</li> </ol>			

**Module 12**

Code	Course/Module Title	ECTS	Semester
UOA006	The crimes of the defunct Ba'ath party	2	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0	33	17
Description			
تهدف هذه المادة الى تعريف الطلبة بالجرائم ضد الإنسانية التي ارتكبت خلال 35 سنة من حكم حزب البعث للبلاد.			

**Module 13**

Code	Course/Module Title	ECTS	Semester
AIDC210	Knowledge Representation	6	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	93	57
Description			
<p>This module will allow students to understand the foundations of KRR and the tradeoff between representation and reasoning. will understand which knowledge-based techniques are appropriate for which tasks; can apply KRR systems to their research and challenging problems.</p> <p>Students must understand logic-based Knowledge Representation principles, model application domains in a logic-based language, understand reasoning services, reasoning algorithms, representation power-computation trade-off, and be familiar with various knowledge representation languages, and understand practical application of theoretical material.</p>			

**Module 14**

Code	Course/Module Title	ECTS	Semester
CCIT062	Numerical Analysis	5	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	47
Description			
<p>This module introduces students to the study of the numerical analysis, methods, applications and its relationship with the real problems. Teach train the students to deal with the numerical process in the future in logic and right style. Additionally, <b>After completing the module</b>, the student should be able to study of numerical approximation techniques for problems of continuous mathematics. We consider</p>			



both theoretical questions regarding how, why and when numerical methods work, and practical implementation using computer programs. Its aims are:

1. Understanding the concept of numerical analysis, its methods and applications.
2. Explain the concept of the Matrices and its application in numerical analysis.
3. Understanding the relationship between the numerical methods and the real problems and how to deal with it.

#### Module 15

Code	Course/Module Title	ECTS	Semester
AIDC213	Basics of Object Oriented Programming	7	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	4	108	67
Description			
<p>This module covers a programming language, system or software methodology that is built on the concepts of logical objects. Usually, the Object Oriented Programming module correspond to classes, packages, files, and components. <b>After completing the module</b>, the student should be able to:</p> <ul style="list-style-type: none"> <li>• Apply the fundamental constructs of imperative and object-oriented programming, and data structures</li> <li>• Write, test and debug computer programs</li> <li>• Design complete computer programs to solve given software problems</li> <li>• Demonstrate an understanding of the advantages and limitations of OOP</li> </ul>			

#### Module 16

Code	Course/Module Title	ECTS	Semester
AIDC212	Computational Theory	5	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	47
Description			
<p>This module introduce general models of computation such as finite state automata and Turing machines and their relationship to classes of languages, and use these models to explore the limits of the power of computers. <b>After completing the module</b>, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Find occurrences of words, phrases, or other patterns; Software for verifying systems of all types that have a finite number of distinct states, such as communication protocols or protocols for secure exchange of information.</li> <li>2. Knowledge and understanding <ul style="list-style-type: none"> <li>• Acquire a full understanding and mentality of Automata Theory as the basis of all computer science languages design.</li> </ul> </li> </ol>			

- Have a clear understanding of the Automata theory concepts such as RE's, DFA's, NFA's, Stack's, Turing machines, and Grammars

3. Cognitive skills (thinking and analysis).

- Be able to design FAs, NFAs, Grammars, languages modelling, small compilers basics

4. Communication skills (personal and academic).

- Be able to minimize FA's and Grammars of Context Free Languages.

#### Module 17

Code	Course/Module Title	ECTS	Semester
AIDC214	Python Programming Language	5	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
<p>This module provides the principles of abstraction and modularity of structure programming. Functions and arrays in python and Introduce the principles of a higher-level programming language of python. Analyze a problem statement to develop a mental model of objects necessary to create a software architecture</p>			

#### Module 18

Code	Course/Module Title	ECTS	Semester
UOA002	Arabic Language II	2	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0	33	17
Description			
<p>هدف هذه المادة الى:  تعليم الطلبة على ادوات اللغة العربية وقواعدها المتقدمة  تعليم الطلبة على كيفية كتابة مقالات  أن يعرف الطالب كيفية هيكلية وتنسيق الكلمات واختيارها  القدرة على استعمال العبارات الصحيحة  القدرة على مشاركة الاخرين في الحوار الصحيح</p>			

**Module 19**

Code	Course/Module Title	ECTS	Semester
AIDC222	Advanced Object-Oriented Programming	8	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	4	123	77
Description			
<p>This module covers a programming language, system or software methodology that is built on the concepts of logical objects. It works through the creation, utilization and manipulation of reusable objects to perform a specific task, process or objective. <b>After completing the module</b>, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Introduce the principles of object-oriented programming in a higher-level programming language in c++.</li> <li>2. Analyze a problem statement to develop a mental model of objects necessary to create a software architecture</li> <li>3. Utilize object-oriented programming to frame software architectures, with care towards separation of concerns and abstraction</li> <li>4. Establish development methods in object-oriented programming to qualify students for teaching the language in other settings</li> </ol>			

**Module 20**

Code	Course/Module Title	ECTS	Semester
AIDC223	Algorithms and Data Structures	7	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	4	108	67
Description			
<p>This class provides students with different ways of how to build an Algorithm (Program) efficiently, How to measure algorithm complexity, what data structure is appropriate for an algorithm. In addition to that it teaches students different data structures and to understand why this data structure is better than the other one and how to choose the best data structure for your algorithm. Also teaches students how to deal with your problem, building its algorithm and fitting the best data structures to it.</p> <p><b>completing the module</b>, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. How to measure the performance of your algorithm.</li> <li>2. What are data structures and how to use them</li> <li>3. Explain and utilize linked lists, stacks, queues and trees.</li> <li>4. Apply design guidelines to evaluate alternative software designs.</li> <li>5. Basic ability to analyze algorithms and to determine algorithm correctness and time efficiency class.</li> </ol>			

6. Master a variety of advanced abstract data type (ADT) and data structures and their implementations.
7. Ability to apply and implement learned algorithm design techniques and data structures to solve problems.

### Module 21

Code	Course/Module Title	ECTS	Semester
AIDC224	Machine Learning Basics	6	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	93	57
Description			
<p>Machine Learning module aims to equip students with a solid foundation of learning algorithms concepts and theories, including supervised and unsupervised learning. Students are expected to have a comprehensive understanding of the fundamental concepts and techniques of machine learning, regression modules, naive bayes, and more advance concepts including support vector machine and neural networks.</p> <p><b>After completing the module</b> Gaining a strong foundation in machine learning concepts, including supervised and unsupervised learning, neural networks, and algorithms, is crucial. Gain hands-on experience in implementing algorithms, preprocessing and cleaning data, evaluating model performance, and exploring practical applications in healthcare, finance, natural language processing, and computer vision.</p>			

### Module 22

Code	Course/Module Title	ECTS	Semester
AIDC225	Artificial Intelligence Algorithms	7	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	93	82
Description			
<p>This module aims to provide a comprehensive understanding of AI algorithms, from foundational concepts to practical applications, and to equip learners with the skills needed to apply these algorithms in real-world scenarios.</p> <p><b>After completing the module</b> Gaining a strong foundation in AI algorithms to address real-world challenges. Gaining the ability in applying in different search algorithms, such as depth-first search and breadth-first search.</p>			

### Module 23

Code	Course/Module Title	ECTS	Semester
UOA002	English Language II	2	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0	33	17
Description			
This module focuses on developing the specific skills required for academic studies and exploring strategies for success in academic learning. It also offers guidance in key study areas and provides plenty of practice to encourage learner independence..			

#### Module 24

Code	Course/Module Title	ECTS	Semester
AIDC311	Compilers	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	62
Description			
<p>The objective the compiler module is to understand the basic principles of compiler design, its various constituent parts, algorithms and data structures required to be used in the compiler. <b>After completing the module</b>, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the fundamental concepts of compiler design: Students should be able to comprehend the basic principles, techniques, and components involved in designing and implementing compilers.</li> <li>2. Analyze and describe the various phases of a compiler: Students should be able to explain the different phases of a compiler, including lexical analysis, syntax analysis, semantic analysis, intermediate code generation, optimization, and code generation.</li> <li>3. Implement a compiler: Students should gain practical experience by implementing a simple compiler for a programming language. This may involve designing and developing the lexical analyzer, parser, semantic analyzer, and code generator.</li> <li>4. Apply formal language theory: Students should understand formal languages, regular expressions, context-free grammars, and automata theory, and be able to apply this knowledge to analyze and manipulate programming languages.</li> <li>5. Test and debug compilers: Students should develop skills in testing and debugging compilers.</li> </ol>			

#### Module 25

Code	Course/Module Title	ECTS	Semester
AIDC312	Computer Architecture	4	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37

Description
<p>This module provides <b>an overview of computer architecture</b>, then progresses to topics on how computer systems execute programs, store information, and communicate. It aims to:</p> <ol style="list-style-type: none"> <li>1. To understand the structure, function and characteristics of computer systems.</li> <li>2. To understand the design of the various functional units and components of computers.</li> <li>3. To identify the elements of modern instructions sets and their impact on processor design.</li> <li>4. To explain the function of each element of a memory hierarchy.</li> <li>5. To identify and compare different methods for computer I/O.</li> </ol> <p>The Outcomes of Module Learning is Enabling students to verify performance analysis, memory system hierarchy, pipelining, and communication.</p>

### Module 26

Code	Course/Module Title	ECTS	Semester
CCIT063	Computer Networks	6	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	93	57
Description			
<p>The Computer Networks module provides the students an introduction to the fundamentals of packet switching technologies as used in the internet. Emphasis is placed on core Internet protocols such as IP and TCP. <b>After completing the module</b>, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Understanding Network Fundamentals: Introduce students to the basic concepts and components of computer networks, including network architectures, protocols, and network layers.</li> <li>2. Exploring Network Protocols: Familiarize students with various network protocols, such as TCP/IP, UDP, HTTP, FTP, DNS, and their roles in facilitating communication and data transfer in computer networks.</li> <li>3. Studying Network Topologies and Technologies: Explore different network topologies, such as bus, star, ring, mesh, and hybrid, and technologies such as Ethernet, Wi-Fi, and cellular networks.</li> <li>4. Learning Network Design and Implementation: Develop skills in designing and implementing computer networks, including network planning.</li> </ol>			

### Module 27

Code	Course/Module Title	ECTS	Semester
AIDC314	Optimization Problems	6	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	72
Description			

Students will be able to analyze and implement AI algorithms to solve complex optimization problems, demonstrating an understanding of their underlying principles and practical application.

**After completing the module,** the student should be able to:

They will be able to demonstrate programming proficiency of AI algorithms, analyze and solve problems, collaborate effectively, and use debugging and testing techniques.

#### Module 28

Code	Course/Module Title	ECTS	Semester
AIDC315	Web Applications	4	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
<p>This module refers to the coding and programming side of website production. It covers the main tools and languages which are used for Website development: Hypertext Markup Language (HTML), Cascading Style Sheets (CSS) and JavaScript. It aims to:</p> <ol style="list-style-type: none"> <li>1. Introduction to the design, creation, and maintenance of web pages and websites.</li> <li>2. How to critically evaluate website quality.</li> <li>3. Learn to create and manipulate images.</li> </ol> <p>After completing the module, the student ability should be Enhanced:</p> <ol style="list-style-type: none"> <li>1. Students will be able to use a variety of strategies and tools to create websites.</li> <li>2. Students will develop awareness and appreciation of the myriad ways that people access the web and will be able to create standards-based websites that are accessible and usable by a full spectrum of users.</li> </ol>			

#### Module 29

Code	Course/Module Title	ECTS	Semester
AIDC316	Advance Machine Learning	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	4	93	32
Description			
<p>This module aims to provide a deep understanding of advanced machine learning concepts and techniques, preparing learners to tackle complex real-world problems and stay at the forefront of machine learning advancements.</p> <p>After completing the module, the student ability should be Enhanced:</p> <ol style="list-style-type: none"> <li>1. Students will be able to understand the principles and applications of supervised machine learning algorithm and kernel methods.</li> <li>2. Understand transfer learning and how to leverage pre-trained models.</li> <li>3. Gain practical experience in solving complex problems using advanced techniques.</li> </ol>			

### Module 30

Code	Course/Module Title	ECTS	Semester
AIDC321	Information Retrieval	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	4	90	35
Description			
<p>This module aims to equip learners with a comprehensive understanding of information retrieval concepts and techniques, preparing them to design and implement effective retrieval systems in various domains. It aims to:</p> <ol style="list-style-type: none"> <li>1. Explore techniques for indexing and tokenization of documents.</li> <li>2. Understand how to create an inverted index for efficient document retrieval.</li> <li>3. Learn about query languages used in information retrieval.</li> </ol> <p>After completing the module, the student ability should be Enhanced:</p> <ol style="list-style-type: none"> <li>1. Students will be able to use a variety of strategies and tools of information retrieval through practical projects. .</li> <li>2. Gain experience in implementing and evaluating information retrieval systems</li> </ol>			

### Module 31

Code	Course/Module Title	ECTS	Semester
AIDC322	Databases	6	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	93	47
Description			
<p>This module aims to create, update, and store the static and the dynamic objects to be used in the simulation, both related to the infrastructure (supply) and to the demand. <b>After completing the module</b>, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Understand relational data model in terms of data structure, data integrity, and data manipulation.</li> <li>2. Understand and create conceptual database models utilizing entity-relationship.</li> <li>3. Design data structures that will limit redundancy and enforce data integrity while conforming to organizational requirements utilizing normalization methodology.</li> <li>4. Understand the theory behind the relational data model as it applies to interactions with current database management systems.</li> <li>5. Interpret a given data model to query the database and transform the data into information using SQL (Structured Query Language).</li> <li>6. Implement a data model in a current RDBMS.</li> </ol>			



7. Create reports based on transactional data, including elements such as data groupings and summary values.

### Module 32

Code	Course/Module Title	ECTS	Semester
AIDC323	Metaheuristic	7	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	4	108	67
Description			
<p>This module aims to understand the concepts and terms and consider joining student groups related to optimization, algorithms, or AI to further the new knowledge about meta-heuristics algorithms. Investigate whether the program offers research opportunities in meta-heuristics and if faculty members have expertise in this area. Research experience can enhance your understanding and skill set. Prepare application materials for all metaheuristic. Be sure to highlight your interest in meta-heuristics.</p> <p><b>After completing the module, the student should be able to:</b></p> <ol style="list-style-type: none"> <li>1. Apply meta-heuristic techniques to solve complex optimization problems.</li> <li>2. Select appropriate meta-heuristic algorithms for specific problem domains.</li> <li>3. Perform parameter tuning and optimization to enhance algorithm performance.</li> <li>4. Apply meta-heuristics to solve real-world optimization problems in various domains, such as logistics, finance, engineering, and healthcare.</li> </ol>			

### Module 33

Code	Course/Module Title	ECTS	Semester
AIDC324	Deep Learning	7	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	4	108	67
Description			
<p>The aim of this module is to provide students with a comprehensive understanding of Deep Learning, a subfield of Artificial Intelligence that focuses on training neural networks with multiple layers. Students will learn the theoretical foundations of Deep Learning, explore various architectures, and gain practical experience in implementing Deep Learning models. The module aims to equip students with the necessary skills to apply Deep Learning techniques to solve real-world problems.</p> <p><b>After completing the module, the student should be able to:</b></p> <ol style="list-style-type: none"> <li>1. Understand the fundamental concepts and principles of Deep Learning.</li> <li>2. Gain knowledge of different Deep Learning architectures and their applications.</li> <li>3. Develop skills in implementing and training Deep Learning models.</li> </ol>			

4. Apply Deep Learning techniques to solve real-world problems.
5. Stay updated with the latest advancements and trends in Deep Learning.

#### Module 34

Code	Course/Module Title	ECTS	Semester
AIDC325	Computer Security	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	47
Description			
<p>This Module refers to controls and measures that guarantee the confidentiality, integrity and availability of the information processed and stored by a computer. The module aims:</p> <ol style="list-style-type: none"> <li>1. To explore the concepts of information security attacks, services, and mechanism.</li> <li>2. To make students familiar with the basic concepts of applied cryptography, including classical cryptography and modern secret key cryptography.</li> <li>3. To explain the mathematical foundation of modern cryptography, especially number theory and finite fields.</li> <li>4. To highlight the practical applications and modes of operation of block ciphers.</li> </ol> <p><b>After completing the module, the student should be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe the basic mathematical and technical issues relating to information security.</li> <li>2. Learning how to leverage these concepts to protect computers from external threats.</li> </ol>			

#### Module 35

Code	Course/Module Title	ECTS	Semester
AIDC411	Operating Systems	6	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	4	108	42
Description			
<p>This module involves a number of interfaces for examining and specifying information about the OS environment of the host machine. The OS module aims:</p> <ol style="list-style-type: none"> <li>1. To critically understand the specialist theories, principles, and concepts of modern operating systems.</li> <li>2. To explain the fundamental structure of a modern operating system and its core functions and services.</li> <li>3. To critically examine and evaluate different strategies and techniques used by operating systems to manage computer resources.</li> <li>4. To examine the algorithmic ideas integrated into the design and implementation of different operating systems.</li> <li>5. To understand how operating systems manage resources such as processors, memory, and I/O.</li> </ol>			

The Outcomes of Module Learning is Enabling students to obtain an understanding and knowledge of the components of an operating system.

### Module 36

Code	Course/Module Title	ECTS	Semester
AIDC412	Data Mining	7	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	4	108	67

#### Description

The aim of the Data Mining module is to provide students with a comprehensive understanding of data mining techniques and their applications. The module aims to equip students with the necessary knowledge and skills to effectively analyze large datasets, discover hidden patterns, and make informed decisions based on the extracted knowledge. Students will learn both the theoretical foundations and practical implementation of data mining algorithms.

#### By completing this module :

- 1- Understand the concepts, principles, and process of data mining.
- 2- Gain knowledge of various data mining algorithms and techniques.
- 3- Develop skills in data preprocessing and feature engineering.
- 4- Apply classification and prediction techniques to solve real-world problems.
- 5- Implement clustering algorithms and interpret clustering results.
- 6- Analyze and interpret association rules and patterns.
- 7- Apply text mining techniques for text classification and sentiment analysis.
- 8- Understand social network analysis concepts and analyze network data.
- 9- Apply time series analysis techniques for forecasting and trend detection.
- 10- Evaluate and interpret the performance of data mining models.
- 11- Apply data mining tools and software for practical implementation.

### Module 37

Code	Course/Module Title	ECTS	Semester
AIDE413	Games Development	6	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	93	57

#### Description

This module aims to provide a comprehensive understanding of game development, covering both technical and creative aspects, and preparing students to contribute to the dynamic and evolving field of game design and production. This module aims:

1. Understand the fundamentals of game development.
2. Understand the principles of physics in games.

3. Implement collision detection and response.
4. Simulate realistic movements and interactions.

**By completing this module :**

1. Demonstrate a solid understanding of the fundamentals of game programming and design principles.
2. Apply programming concepts and techniques to develop game mechanics and functionality.
3. Implement physics simulations and realistic behaviors in games, including collision detection and response.
4. Design and develop intelligent game characters.

**Module 38**

Code	Course/Module Title	ECTS	Semester
UOA019	Research methodology	4	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37

**Description**

This module explain how a student intends to carry out their research. It is broadly defined as the application of theories, concepts and techniques of research activities to perform scientific research works.

**After completing the module,** the student should be able to::

1. To familiarize students with the research process, including the various stages involved, from formulating a research question to presenting findings.
2. To develop students' skills in conducting research, including identifying research problems, designing appropriate research methods, collecting and analyzing data, and drawing valid conclusions.
3. Familiarity with research design: The course focuses on introducing different research designs, such as experimental, correlational, qualitative, and quantitative, and helps students understand their strengths, limitations, and appropriate applications.
4. To conduct a comprehensive review of existing literature on a specific topic, identify gaps in knowledge, and situate their research within the broader scholarly context.
5. Ethical considerations: The course emphasizes the importance of ethical conduct in research, such as obtaining informed consent, protecting participants' rights, and maintaining integrity in data collection, analysis, and reporting.
6. To learn various data collection methods, including surveys, interviews, observations, and experiments. They also gain knowledge about data analysis techniques, including descriptive statistics, inferential statistics, and qualitative analysis.
7. Critical thinking and problem-solving: The course encourages students to think critically about research problems, evaluate research designs and methodologies, and develop problem-solving skills to overcome challenges encountered during the research process.
8. To communicate their research effectively through various means, such as research reports, academic papers, oral presentations, and posters.

**Module 39**

Code	Course/Module Title	ECTS	Semester
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AIDC415	Robotics	7	7
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	5	108	67
<b>Description</b>			
<p>This module aims to provide a comprehensive understanding of robotics, covering both theoretical principles and practical applications, and preparing students to contribute to the field of robotics in various industries. This module aims:</p> <ul style="list-style-type: none"> <li>• Understand the definition and scope of robotics.</li> <li>• Understand the mechanical components and principles in robotics.</li> <li>• Explore electronic components and sensor technologies used in robotics.</li> </ul> <p><b>After completing the module</b>, the student should be able to::</p> <ul style="list-style-type: none"> <li>• Students will Identify key applications and historical developments in robotics.</li> <li>• Analyze kinematics and dynamics, apply design principles to robotic manipulators.</li> <li>• Integrate sensors into robotic systems, process sensor data for decision-making</li> <li>• Develop basic robot control programs, navigate Robot Operating System (ROS).</li> </ul>			

#### Module 40

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AIDC421	Natural Languages Processing (NLP)	5	8
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	3	78	47
<b>Description</b>			
<p>The aim of this module is to provide students with a comprehensive understanding of Natural Language Processing (NLP), a subfield of Artificial Intelligence that focuses on the interaction between computers and human language. Students will learn the theoretical foundations and practical techniques used in NLP, including text preprocessing, language modeling, sentiment analysis, and machine translation. The module aims to equip students with the necessary skills to develop NLP applications and work with textual data.</p> <p><b>After completing the module</b>, the student should be able to:</p> <ol style="list-style-type: none"> <li>1- Understand the fundamental concepts and principles of Natural Language Processing.</li> <li>2- Gain knowledge of various techniques and algorithms used in NLP.</li> <li>3- Develop skills in text preprocessing, tokenization, and language modeling.</li> <li>4- Apply sentiment analysis techniques to analyze and classify textual data.</li> <li>5- Implement machine translation systems using NLP techniques.</li> <li>6- Evaluate and interpret the performance of NLP models.</li> </ol>			

**Module 41**

Code	Course/Module Title	ECTS	Semester
AIDC421	Digital Forensics	4	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	22
Description			
<p>The aim of this module is to understanding the Digital Forensics and its definitions, characteristics, and types. Distinguishing between digital forensics tools and techniques. Designing smart systems for solving daily life problems in cybercrimes</p> <p><b>After completing the module</b>, the student should be able to:            Students will learn the fundamental principles of forensic science. This hands-on course covers the technical aspects of digital forensics including general forensic procedures, imaging, hashing, file recovery, file system basics, identifying mismatched file types, reporting, and laws regarding computer evidence. Students will also use open-source digital forensic software tools to conduct forensic examinations</p>			

**Module 42**

Code	Course/Module Title	ECTS	Semester
AIDC423	Pattern Recognition	5	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
<p>This module aim to provide the student with a clear understanding of what pattern recognition is and why it is important in various fields. It provides students with practical skills in using pattern recognition libraries, tools, and software for implementing and testing algorithms.</p> <p><b>After completing the module</b>, the student should be able to::</p> <ul style="list-style-type: none"> <li>• Students will be able to deal with various pattern recognition problems.</li> <li>• A complete understanding of fundamentals of pattern recognition such as role of features, classifiers, and decision boundaries.</li> <li>• A hand on Supervised and unsupervised learning skills.</li> <li>• A hand on Machine Learning tools used in pattern recognitions.</li> </ul>			

**Module 43**

Code	Course/Module Title	ECTS	Semester
AIDC424	Big Data	4	8

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
<p>The aim of this module is to provide an understanding of Big Data and its significance in various domains. Students will explore the concepts, technologies, and techniques used to manage, process, and analyze large and complex datasets. They will also gain insights into the ethical considerations, challenges, and potential applications of Big Data.</p> <p><b>After completing the module</b>, the student should be able to:</p> <ul style="list-style-type: none"> <li>• Understand the concept of Big Data and its characteristics.</li> <li>• Gain knowledge of the technologies and tools used for Big Data management and processing.</li> <li>• Develop skills in data preprocessing, cleaning, and integration for Big Data.</li> <li>• Apply appropriate techniques for analyzing and visualizing Big Data.</li> <li>• Evaluate the ethical implications and challenges associated with Big Data.</li> <li>• Explore potential applications and industry use cases of Big Data.</li> </ul>			

#### Module 44

Code	Course/Module Title	ECTS	Semester
AIDC425	Recommendation Systems	4	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
<p>The aim of this module is to provide students with a comprehensive understanding of Recommendation Systems, a field of study that focuses on providing personalized recommendations to users based on their preferences and behavior. Students will learn the theoretical foundations and practical techniques used in building recommendation systems. The module aims to equip students with the necessary skills to design and implement recommendation systems in various domains.</p> <p><b>After completing the module</b>, the student should be able to:</p> <ol style="list-style-type: none"> <li>1- Understand the fundamental concepts and principles of Recommendation Systems.</li> <li>2- Gain knowledge of various recommendation algorithms and techniques.</li> <li>3- Develop skills in data preprocessing and feature engineering for recommendation systems.</li> <li>4- Apply collaborative filtering and content-based filtering techniques.</li> <li>5- Evaluate and interpret the performance of recommendation systems.</li> <li>6- Design and implement personalized recommendation systems.</li> <li>7- Stay updated with the latest advancements and trends in Recommendation Systems.</li> </ol>			

#### Module 45

Code	Course/Module Title	ECTS	Semester
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UOA020	Project	8	8
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
0	6	93	107

Description
The Applied Project Module aims to bridge the gap between theoretical learning and practical application, providing students with a holistic and experiential learning experience. It prepares them for the challenges and demands of their future careers by equipping them with valuable skills and experiences.



### **3. Contact**

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## Semester-1

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Computer Technology</b>		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	AIDC113		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department	AI	College	Type College Code
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	

<b>Module Objectives</b> أهداف المادة الدراسية	<ul style="list-style-type: none"> <li>- Provide a basic knowledge of computer hardware and software</li> <li>- Introduce the business areas to which computers may be applied.</li> <li>- Provide an introduction to business organization and information systems.</li> <li>- Develop the skills in network &amp; communication , which play an important part in business computing and information processing</li> </ul>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ul style="list-style-type: none"> <li>- The student should understand the architecture of any IT systems.</li> <li>- The student should understand the parts of hardware.</li> <li>- The student should understand the system software.</li> <li>- The student should understand the architecture of networks ,protocols and communications devices.</li> </ul>
<b>Indicative Contents</b> المحتويات الإرشادية	Data Conversion · D/A converters · A/D converters · Sample and Hold circuits Digital Component Operations · Multiplexing · Data storage · Integrated Circuits Digital Technology · Memory Technology · Circuit Board Technology · Nano-Technology

<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<ul style="list-style-type: none"> <li>- The student should use utilities in the lab to apply scientific experiment</li> <li>- The ability to execute the applications software .</li> </ul>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of Computers and Programming
Week 2	Brief history of computer
Week 3	Generation of Computers & Computer hierarchy
Week 4	Basic Computer Components
Week 5	Computer function (fetch cycle, interrupt cycle, I/O function)
Week 6	Semiconductor main memory (RAM, ROM, CACHE)
Week 7	Midterm Exam
Week 8	Computer Software(application software)
Week 9	External & Internal memory
Week 10	Telecommunications system & Network
Week 11	Topology of a network and layering
Week 12	data representation
Week 13	Multimedia
Week 14	Computer Security
Week 15	All Topics
Week 16	Preparatory week before the final Exam

<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
	Material Covered
<b>Week 1</b>	Basic Computer Components
<b>Week 2</b>	Computer function (fetch cycle, interrupt cycle, I/O function)
<b>Week 3</b>	Computer function (fetch cycle, interrupt cycle, I/O function)
<b>Week 4</b>	Semiconductor main memory (RAM, ROM, CACHE)
<b>Week 5</b>	Computer Software(application software)
<b>Week 6</b>	Computer Software(application software)
<b>Week 7</b>	External & Internal memory
<b>Week 8</b>	External & Internal memory
<b>Week 9</b>	Telecommunications system & Network
<b>Week 10</b>	Topology of a network
<b>Week 11</b>	Topology of a network
<b>Week 12</b>	Layering model
<b>Week 13</b>	Layering model
<b>Week 14</b>	Protocols
<b>Week 15</b>	addressing communications

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	1.Computing Essentials Making IT work for you 2017 by Timothy J. O’Leary. 2.Computer Organization and Architecture Designing for Performance (8th Edition).	No
<b>Recommended Texts</b>		No
<b>Websites</b>		

<b>Grading Scheme</b> مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	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
<b>Fail Group (0 – 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	راسب	(0-44)	Considerable amount of work required

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Programming Basics		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	AIDC112		
ECTS Credits	9		
SWL (hr/sem)	225		
Module Level	1	Semester of Delivery	
Administering Department	AI	College	Type College Code
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> أهداف المادة الدراسية	<ul style="list-style-type: none"><li>• Understand the concepts and terms used to describe languages that support the imperative, functional, and logic programming paradigms.</li><li>• Solve problems using the functional paradigm</li></ul>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	Develop proficiency in the C++ programming language, including a strong understanding of its syntax, semantics, data types, control structures, functions, and object-oriented programming concepts.
<b>Indicative Contents</b> المحتويات الإرشادية	Introduction to C++ Programming Object-Oriented Programming (OOP) in C++ C++ Standard Library Memory Management in C++ Data Structures and Algorithms in C++ C++ Application Development

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	Conceptual Understanding: Hands-on Practice Code Review and Feedback Problem-Solving Exercises
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## Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطلاب خلال الفصل	123	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطلاب أسبوعيا	8
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطلاب خلال الفصل	102	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطلاب أسبوعيا	7
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطلاب خلال الفصل	<b>225</b>		

## Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	10% (10)	13	LO #5, #8 and #10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	7	LO #1 - #7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	<b>Algorithms</b>

<b>Week 2</b>	<b>Introduction to programming languages and C++</b>
<b>Week 3</b>	<b>Variables</b>
<b>Week 4</b>	<b>C++ Libraries</b>
<b>Week 5</b>	<b>C++ User Input</b>
<b>Week 6</b>	<b>C++ Operators</b>
<b>Week 7</b>	<b>Mid-term Exam</b>
<b>Week 8</b>	<b>C++ Strings &amp; C++ Math</b>
<b>Week 9</b>	<b>C++ Booleans</b>
<b>Week 10</b>	<b>If condition</b>
<b>Week 11</b>	<b>Switch condition</b>
<b>Week 12</b>	<b>While loop</b>
<b>Week 13</b>	<b>Do-while loop</b>
<b>Week 14</b>	<b>For loop</b>
<b>Week 15</b>	<b>C++ Break and Continue</b>
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

<b>Delivery Plan (Weekly Lab. Syllabus)</b>	
المنهاج الاسبوعي للمختبر	
	<b>Material Covered</b>
<b>Week 1</b>	<b>C++ Libraries</b>
<b>Week 2</b>	<b>C++ User Input</b>
<b>Week 3</b>	<b>C++ Operators</b>
<b>Week 4</b>	<b>If condition</b>
<b>Week 5</b>	<b>Switch condition</b>
<b>Week 6</b>	<b>While loop</b>

Week 7	Do-while loop
Week 8	For loop
Week 9	C++ Break and Continue

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	The C++ Programming Language (4th Edition) by by Bjarne Stroustrup	No
Recommended Texts		
Websites	<a href="https://www.learncpp.com/">https://www.learncpp.com/</a> <a href="https://www.w3schools.com/CPP/default.asp">https://www.w3schools.com/CPP/default.asp</a>	

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
<p><b>Note:</b> Marks 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.</p>				

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Introduction to Artificial Intelligence (AI)		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	AIDC111		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	1
Administering Department	AI	College	Type College Code
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> أهداف المادة الدراسية	The aim of this module is to provide an introduction to Artificial Intelligence (AI) and its various applications. Students will gain a comprehensive understanding of the fundamental concepts, techniques, and algorithms used in AI, as well as the ethical considerations associated with its use. The module will also explore the impact of AI on society, economy, and various industries.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	By the end of this module, students are expected to: <ol style="list-style-type: none"><li>1. Understand the basic concepts and principles of Artificial Intelligence.</li><li>2. Gain knowledge of various AI techniques and algorithms.</li><li>3. Develop an understanding of the ethical implications of AI.</li><li>4. Analyze the impact of AI on different aspects of society and industry.</li><li>5. Apply AI techniques to solve real-world problems.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	Introduction to Artificial Intelligence Definition, brief history, and scope of AI. Different types of AI systems. Problem Solving and Search Algorithms Problem formulation and representation. Uninformed search algorithms (e.g., breadth-first search, depth-first Machine Learning Ethical and Social Implications of

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	Conceptual Understanding:
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	Hands-on Practice Code Review and Feedback Problem-Solving Exercises
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	93	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	10% (10)	13	LO #5, #8 and #10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	7	LO #1 - #7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Historical overview of AI, AI Introduction
Week 2	Programing and AI important
Week 3	AI Types
Week 4	Problem Solving: <b>Introduction to problem-solving techniques and algorithms</b>
Week 5	AI Applications Overview: <b>A survey of AI applications in various domains such as healthcare, finance, and gaming.</b>
Week 6	<b>search algorithms like depth-first search and breadth-first search.</b>
Week 7	Mid-term Exam
Week 8	Machine Learning Basics: <b>A brief introduction to the fundamentals of machine learning</b>
Week 9	<b>Supervised learning</b>
Week 10	<b>unsupervised learning</b>
Week 11	<b>Expert systems</b>
Week 12	<b>Knowledge base</b>
Week 13	<b>Rule based approaches</b>
Week 14	<b>AI Ethics Awareness: An introduction to ethical considerations in AI, including fairness, bias, and responsible AI development.</b>
Week 15	<b>Preparatory week before the final Exam</b>

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
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<b>Required Texts</b>	Book Title: "Artificial Intelligence: A Guide to Intelligent Systems" Author: Michael Negnevitsky	No
<b>Recommended Texts</b>		
<b>Websites</b>		

<b>Grading Scheme</b> مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> (50 - 100)	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> (0 - 49)	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	راسب	(0-44)	Considerable amount of work required
<p><b>Note:</b> Marks 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.</p>				



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mathematics		Module Delivery
Module Type	B		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CCIT060		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	
Administering Department	AI	College	Type College Code
Module Leader	Mohammed Salah Ibrahim	e-mail	Moh.salah@uoanbar.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> أهداف المادة الدراسية	Core Mathematical Knowledge: The course aims to provide students with a solid foundation of core mathematical concepts and theories. This includes topics such as algebra, calculus, geometry, discrete mathematics, probability, and statistics. The aim is to ensure that students have a comprehensive understanding of fundamental mathematical principles.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	By the end of the module, students should be able to: <ul style="list-style-type: none"><li>-Understand and use basic mathematical terminology.</li><li>- Understand the role of formal definitions and proofs and be able to apply them in problem solving.</li><li>- Understand the basics of propositional and predicate logic.</li><li>- Understand the basics of elementary set theory.</li><li>- Understand the basics of mathematical relations and functions.</li><li>- Understand the basics of graph theory.</li></ul>
<b>Indicative Contents</b> المحتويات الإرشادية	Calculus Linear Algebra Discrete Mathematics Probability and Statistics Differential Equations

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	Hands-on Practical Exercises Case Studies and Real-World Examples Collaborative Learning Continuous Assessment and Feedback
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<b>Student Workload (SWL)</b>			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطلاب خلال الفصل	93	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطلاب أسبوعيا	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطلاب خلال الفصل	57	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطلاب خلال الفصل	<b>150</b>		

<b>Module Evaluation</b>					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects / Lab.</b>	1	5% (5)	Continuous	All
	<b>Report</b>	1	5% (5)	13	LO #5, #8 and #10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	20% (20)	7	LO #1 - #7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b>	
المنهاج الاسبوعي النظري	
	<b>Material Covered</b>

<b>Week 1</b>	Functions: Function Definition, Domain and range of functions, Graphing of function
<b>Week 2</b>	Limits: Definition of limits, Theorems of limits, Type of limits
<b>Week 3</b>	The Definition and Interpretation of the Derivative
<b>Week 4</b>	Methods of proof and Mathematical induction
<b>Week 5</b>	Counting principles Permutations and combinations
<b>Week 6</b>	Pigeonhole principle Inclusion-exclusion principle
<b>Week 7</b>	Midterm
<b>Week 8</b>	Number Theory: <ul style="list-style-type: none"> <li>● Prime numbers and factorization</li> <li>● Modular arithmetic</li> <li>● GCD and LCM</li> <li>● Applications in cryptography</li> </ul>
<b>Week 9</b>	Probability and Statistics: <ul style="list-style-type: none"> <li>● Probability spaces</li> <li>● Random variables and distributions</li> <li>● Expectation and variance</li> <li>● Applications in data analysis and algorithm analysis</li> </ul>
<b>Week 10</b>	Linear Algebra for Computer Science: <ul style="list-style-type: none"> <li>● Vectors and matrices</li> </ul>
<b>Week 11</b>	<ul style="list-style-type: none"> <li>● Linear transformations</li> </ul>
<b>Week 12</b>	<ul style="list-style-type: none"> <li>● Eigenvalues and eigenvectors</li> <li>● Applications in Machine Learning</li> </ul>
<b>Week 13</b>	Special Topics:

	<ul style="list-style-type: none"> <li>• Cryptography</li> <li>• Computation theory and Complexity theory</li> </ul>
<b>Week 14</b>	Final Exam
<b>Week 15</b>	Recap for the final exam

<b>Learning and Teaching Resources</b>		
مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	Calculus , Thomas ,1990,5th edition	Yes
<b>Recommended Texts</b>	Howard Anton, Irl Bivens, Stephen Davis, CALCULUS, 10th Edition, John Wiley & Sons, Inc., 2012.	No
<b>Websites</b>		

<b>Grading Scheme</b>				
مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	راسب	(0-44)	Considerable amount of work required

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language I		Module Delivery
Module Type	S		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOA003		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	
Administering Department	Artificial Intelligence	College	Computer Science and Information Technology
Module Leader	Kibrea Abdul-Kadhim Jasim	e-mail	Kibrea.a.jasim@uoanbar.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	Asst.Lec.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> أهداف المادة الدراسية	Enhance Language Proficiency: The course aims to enhance students' language proficiency in English, including their reading, writing, speaking, and listening skills. It focuses on improving grammar, vocabulary, pronunciation, and overall communication abilities
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p>Developing advanced reading comprehension skills and critical analysis of various texts.</p> <p>Enhancing writing skills across different genres and formats.</p> <p>Improving oral communication and presentation skills.</p> <p>Expanding language proficiency in English, including grammar, vocabulary, and pronunciation.</p> <p>Analyzing and interpreting literary works from diverse genres and periods.</p> <p>Conducting effective research and demonstrating information literacy.</p> <p>Cultivating critical thinking skills and forming well-supported opinions.</p> <p>Enhancing intercultural communication and understanding.</p> <p>Fostering creativity and imaginative expression through literature and writing.</p> <p>Cultivating a love for lifelong learning in the field of English.</p>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Study of various literary genres, such as poetry, drama, and prose.</p> <p>Analysis of literary works from different periods and cultural contexts.</p> <p>Development of critical reading and interpretation skills.</p> <p>Exploration of language and linguistics, including grammar, syntax, and phonetics.</p> <p>Introduction to literary theories and their application in analyzing texts.</p> <p>Practice in academic writing, including essay composition and research skills.</p> <p>Development of oral communication and presentation skills.</p> <p>Examination of cultural and historical contexts that influence literature.</p> <p>Integration of technology and digital resources in language and literary studies.</p> <p>Opportunities for creative writing and expression.</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

#### Strategies

1. Reading and Text Analysis: Provide a variety of reading materials, including literary texts, articles, and authentic sources. Guide students in analyzing and interpreting texts, identifying main ideas, and extracting key information. Facilitate class discussions to promote comprehension and critical thinking.
2. Writing Workshops and Peer Feedback: Conduct writing workshops where students can refine their writing skills and receive feedback from peers and the instructor. Incorporate writing exercises that focus on specific writing techniques and genres. Provide guidance and support in the writing process, including brainstorming, drafting, revising, and editing.
3. Presentations and Public Speaking: Assign oral presentations on various topics to enhance students' public speaking skills. Provide guidelines and practice opportunities for effective delivery, organization, and visual aids. Offer constructive feedback to help students improve their presentation skills.
4. Grammar and Vocabulary Activities: Incorporate interactive grammar and vocabulary activities, such as exercises, games, and quizzes, to reinforce language skills. Provide explicit instruction on grammar rules and strategies for vocabulary acquisition. Encourage students to use new grammar and vocabulary in context.

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>50</b>		

## Module Evaluation

### تقييم المادة الدراسية



		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1		Continuous	All
	Report	1		13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (60)	16	All
Total assessment			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	<p>Hello</p> <p>Grammar spot (is, are, am)</p> <p>Possessive Pronouns</p> <p>Everyday English (conversation)</p> <p>Word order</p> <p>Sounds</p>
<b>Week 2</b>	<p>Your world</p> <p>Nationalities</p> <p>Grammar spot (abbreviations, Completing a question, Checking the correct sentence)</p> <p>Complete a conversation</p>
<b>Week 3</b>	<p>All about you</p> <p>Grammar spot (Negatives, abbreviations, and Short answers )</p>

	<p>Writing Personal information (profile)</p> <p>Listening to a conversation</p> <p>Social expressions and jobs</p>
<b>Week 4</b>	<p>Family and friends</p> <p>Objective Pronouns</p> <p>Possession (Possessive pronouns, Possessive S, Has and have)</p> <p>Grammar spot (Checking the correct sentence)</p> <p>Pronunciation</p>
<b>Week 5</b>	<p>The way I live</p> <p>Vocabulary: sports, food, and drinks</p> <p>Grammar spot: (positive, negative, adjectives, and articles: a/an)</p> <p>Listening and speaking</p> <p>Matching countries with nationalities</p>
<b>Week 6</b>	<p>Every day</p> <p>Writing (times)</p> <p>Grammar spot (present simple and its adverbs)</p> <p>Pronunciation (s)</p> <p>Vocabulary and speaking</p> <p>Prepositions</p>
<b>Week 7</b>	<p>Mid-term Exam</p>
<b>Week 8</b>	<p>My favourites/Where I live</p> <p>Grammar spot: Question words, positive, negative, question, and word order.</p> <p>Conversation : using this/ that</p> <p>Vocabulary: completing adjectives, synonyms and antonyms, Everyday English (places and activities).</p> <p>Writing a letter, a postcard and a paragraph. Everyday English: directions</p>

<b>Week 9</b>	<p>Times past</p> <p>Grammar spot: passive voice, past simple, questions, past tense adverbs, and question words.</p> <p>Reading and speaking: past form</p> <p>Vocabulary: Using have, do, go, and time expressions</p> <p>Listening and speaking: sport, leisure, seasons, and months.</p>
<b>Week 10</b>	<p>We had a great time</p> <p>Grammar spot: past tense: regular and irregular forms</p> <p>Pronunciation of /t/, /d/ and /id/</p> <p>Vocabulary: technical terms</p>
<b>Week 11</b>	<p>I can do that</p> <p>Grammar spot: can, adverbs (fast and well), Regular adverbs, and request and offer</p> <p>Pronunciation of can</p> <p>Vocabulary and speaking: adjectives, and everyday English</p>
<b>Week 12</b>	<p>Please and thank you</p> <p>Speaking : activities and places,</p> <p>Grammar spot: would like, some and any, always, and now and soon</p> <p>Reading and speaking: food names, and everyday English (signs all around)</p> <p>Vocabulary: Technical expressions</p>
<b>Week 13</b>	<p>Second Exam</p>
<b>Week 14</b>	<p>Here and now</p> <p>Vocabulary and listening : colours, opposite verbs, everyday English (sense terms)</p> <p>Grammar spot: present continuous</p>
<b>Week 15</b>	<p>It's time to go</p> <p>Writing: transport</p>

	<p>Grammar spot: going to and present continuous, and Question words</p> <p>Vocabulary revision, Everyday English (social expressions), and Technical abbreviations.</p> <p>Pronunciation of two and three syllables</p>
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Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Headway Plus Beginner, by John and Liz Soars,2010	Yes
Recommended Texts		
Websites		

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:** Marks 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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	الديموقراطية وحقوق الإنسان		Module Delivery
Module Type	S		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOA005		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	
Administering Department	AI	College	Type College Code
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> أهداف المادة الدراسية	<p>أ. تعليم الطلبة على أساسيات حقوق الإنسان وقوانينها .</p> <p>ب. التعرف على الحقوق وأهم الإشكاليات والتحديات التي تواجهها</p> <p>ج- تحديد وفهم المفاهيم المتعلقة بالحريات، بما في ذلك الحقوق الفردية والحريات الشخصية .</p> <p>د. تنمية القدرة على التفكير النقدي حول القضايا المتعلقة بالحريات والحقوق الفردية.</p>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p>1- أن يعرف الطالب مفهوم الحقوق وقوانينها وتطبيقاتها .</p> <p>2- أن يعرف الطالب كيفية المشاركة في نشر الحقوق وتطبيقها بالعمل الواقعي الحقيقي.</p> <p>3- القدرة على استخدام الحقوق وسيلة من أجل التعايش السلمي بين مكونات المجتمع وجميع المخلوقات .</p> <p>4- القدرة على مشاركة الآخرين في نشر هذه الحقوق .</p> <p>5- القدرة على تحليل وتعريف مفهوم الحرية والتمييز بين أنواع مختلفة من الحريات.</p> <p>6- التفاعل مع قضايا الحريات على الصعيدين الوطني والدولي والتأثير في تشكيل الرأي العام.</p>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>الحقوق والحريات الأساسية وغير الأساسية</p> <p>الحقوق والحريات المدنية</p> <p>الحقوق السياسية</p> <p>حقوق الانسان والقانون الدولي الإنساني</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>1- المشاركة بالتحضير في قاعة الدرس</p> <p>2- طريقة الأسئلة والأجوبة في قاعة الدرس</p> <p>3- الواجبات</p> <p>4- التقارير</p>
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## Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطلاب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطلاب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطلاب خلال الفصل	<b>50</b>		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects / Lab.</b>	1		Continuous	All
	<b>Report</b>	1	10% (10)	13	LO #5, #8 and #10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	7	LO #1 - #7
	<b>Final Exam</b>	3hr	60% (60)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>

Week 1	مفهوم الديمقراطية ومميزاتها
Week 2	الديمقراطية المباشرة
Week 3	الديمقراطية شبه المباشرة
Week 4	الديمقراطية غير المباشرة
Week 5	ركائز الديمقراطية
Week 6	آليات الديمقراطية
Week 7	تعريف حقوق الإنسان
Week 8	امتحان
Week 9	الحقوق الأساسية وغير الأساسية
Week 10	الحقوق المدنية
Week 11	الحقوق السياسية
Week 12	الحقوق الاقتصادية والاجتماعية والثقافية
Week 13	الحقوق الفردية والحقوق الجماعية وطائفة الحقوق الجديدة
Week 14	حقوق الإنسان والقانون الدولي الإنساني
Week 15	حقوق الإنسان في الإسلام

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Diamond L. & M. F. Plattner, eds., (2009), Democracy. A Reader, Baltimore, Johns Hopkins University Press.	yes
Recommended Texts	مفهوم الحريات العامة وحقوق الانسان ، إطارها التاريخي والفكري والفلسفي، وضماداتها الأساسية- 2010	
Websites	<a href="http://ghrorg-learning.blogspot.com">http://ghrorg-learning.blogspot.com</a>	



## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 - 49)</b>	<b>FX</b> – Fail	راسب (فيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

**Note:** Marks 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.

## Semester-2

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Discrete Structures		Module Delivery
Module Type	B		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CCIT061		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department	AI	College	Type College Code
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CCIT060	Semester	1
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1- To Describe the aim of study discrete mathematics</li> <li>2- To Understand what difference between ordinary math and discrete math.</li> <li>3- To Understand what the relation between computer science and math</li> <li>4- To Learn the operation between the difference objects of math.</li> <li>5- To Apply the relation between this objects</li> </ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>A- Knowledge and Understanding</p> <ol style="list-style-type: none"> <li>1. Understand the concept of ordinary and partial</li> <li>2. Understand the set theory</li> <li>3. Understand the logic math</li> <li>4. Understand the relation of two sets</li> <li>5. Understand the graph theory</li> </ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<ul style="list-style-type: none"> <li>• <b>Sets and Graphs</b> Sets and subsets: definitions, examples, Set operations, basic identities, power of a set, Cartesian product of sets, relations on sets, Basic graph terminology.</li> <li>• <b>Recurrence relations (Difference Equations)</b> Definition of a recurrence relation (difference equations), Homogeneous and inhomogeneous difference equations, Nonlinear difference equations: <math>x_{n+1} = g(x_n)</math>, Fixed points, linearisation, stability of fixed points. Applications: the Newton and Secant Methods to solve non-linear equations <math>f(x) = 0</math>, Programming: Short introduction to Matlab, Numerical algorithms for difference equations: Newton's method, Fibonacci sequences, Recursion.</li> </ul>

## Learning and Teaching Strategies

## استراتيجيات التعلم والتعليم

<b>Strategies</b>	<ul style="list-style-type: none"> <li>- By solving many exercises</li> <li>- Daily and weekly quizzes.</li> <li>- Guiding the student to some electronic websites.</li> </ul>
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## Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطلاب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطلاب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطلاب خلال الفصل	47	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطلاب خلال الفصل	<b>125</b>		

## Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects / Lab.</b>	1	5% (5)	Continuous	All
	<b>Report</b>	1	5% (5)	13	LO #5, #8 and #10

Summative assessment	Midterm Exam	2hr	20% (20)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b>	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Abstract of discrete mathematics
Week 2	Set theory
Week 3	Solve some example
Week 4	Logic
Week 5	Solve some example
Week 6	Functions
Week 7	Mid-term Exam
Week 8	Relation
Week 9	Some examples
Week 10	Graph theory
Week 11	Some example
Week 12	Tree
Week 13	Solve example
Week 14	Solve example
Week 15	Review
Week 16	Preparatory week before the final Exam

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>		
<b>Recommended Texts</b>		
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX</b> - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> - Fail	راسب	(0-44)	Considerable amount of work required

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Structured Programming</b>		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar
Module Code	AIDC123		
ECTS Credits	9		
SWL (hr/sem)	225		
Module Level	1	Semester of Delivery	
Administering Department	AI	College	Type College Code
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	AIDC112	Semester	1
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> أهداف المادة الدراسية	Learn how to use the Advanced Tools helps programmers write fast, portable programs The main principles of programming and the development of programming languages Learn the principles of Structure programming
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ul style="list-style-type: none"> <li>- Learn the algorithms</li> <li>- Learn the Flowchart</li> <li>- Learn C++ Programming</li> </ul>
<b>Indicative Contents</b> المحتويات الإرشادية	Introductions to C++ Programming; Introductions to essential computer graphics concepts and theories; Object Oriented programming for 2D graphics; Algorithms design for 2D graphics; Graphic interface creations and implementations.

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<ul style="list-style-type: none"> <li>- Daily and weekly quizzes.</li> <li>- Class room activities.</li> <li>- Guiding the student to some electronic websites.</li> </ul>
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	123	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	8
<b>Unstructured SWL (h/sem)</b>	102	<b>Unstructured SWL (h/w)</b>	7



الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
<b>Total SWL (h/sem)</b>	<b>225</b>		
الحمل الدراسي الكلي للطلاب خلال الفصل			

<b>Module Evaluation</b>					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	10% (10)	13	LO #5, #8 and #10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	7	LO #1 - #7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b>	
المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Function
<b>Week 2</b>	Passing Parameters. Passing by Value. Passing by Reference.
<b>Week 3</b>	Pointers
<b>Week 4</b>	Arrays. Array of One Dimension: Declaration of Arrays.
<b>Week 5</b>	Initializing Array Elements

<b>Week 6</b>	Accessing Array Elements
<b>Week 7</b>	Mid-term Exam
<b>Week 8</b>	Read / Write / Process Array Elements.
<b>Week 9</b>	Array of Two Dimension: Declaration of 2D-Arrays
<b>Week 10</b>	Read / Write / Process Array Elements.
<b>Week 11</b>	Member Function of String stdlib Library.
<b>Week 12</b>	Structures. The Three Ways for Declare the Structure.
<b>Week 13</b>	Array of Structures.
<b>Week 14</b>	The Files
<b>Week 15</b>	
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

<b>Delivery Plan (Weekly Lab. Syllabus)</b>	
المنهاج الاسبوعي للمختبر	
	<b>Material Covered</b>
<b>Week 1</b>	Function
<b>Week 2</b>	Passing Parameters. Passing by Value. Passing by Reference.
<b>Week 3</b>	Pointers
<b>Week 4</b>	Arrays. Array of One Dimension: Declaration of Arrays.
<b>Week 5</b>	Initializing Array Elements
<b>Week 6</b>	Accessing Array Elements
<b>Week 7</b>	Array of Two Dimension: Declaration of 2D-Arrays
<b>Week 8</b>	Read / Write / Process Array Elements.
<b>Week 9</b>	Array of Structures.
<b>Week 10</b>	The Files

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Mastering C++, shomme's series	yes
<b>Recommended Texts</b>		
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Logic Design		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	AIDC124		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	
Administering Department	AI	College	Type College Code
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1- The student should understand number systems and codes and conversion between them.

	<p>2- The student should understand the Boolean expression and how to apply it.</p> <p>3- The student should recognize among different logic gates and how to use them.</p> <p>4- The student should understand how to design a logic circuit.</p> <p>5- The student should understand using K-map for simplification.</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>Demonstrate a solid understanding of digital logic principles, including Boolean algebra, logic gates, truth tables, and the concept of binary representation.</p>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>Introduction to Digital Logic</p> <p>Combinational Logic Design</p> <p>Arithmetic circuits</p> <p>Sequential Logic Design</p> <p>Circuit Testing and Verification</p>

<p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p>	
<p><b>Strategies</b></p>	<p>Conceptual Understanding</p> <p>Problem-Solving Approach</p> <p>Hands-on Laboratory Experience</p> <p>Design Projects</p> <p>Simulation and Modeling</p> <p>Problem-Based Learning</p>

<p><b>Student Workload (SWL)</b></p> <p>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا</p>	
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<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	93	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>		

<b>Module Evaluation</b>					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	10% (10)	13	LO #5, #8 and #10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	7	LO #1 - #7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b>	
المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Introduction: Digital System
<b>Week 2</b>	Number Systems: Octal and Hexadecimal Numbers
<b>Week 3</b>	Number base conversion
<b>Week 4</b>	<ul style="list-style-type: none"> <li>● Theories of Boolean Algebra</li> <li>● Digital Logic gates</li> </ul>

<b>Week 5</b>	Boolean Expression and Truth table
<b>Week 6</b>	<ul style="list-style-type: none"> <li>● Sum of Product Simplification</li> <li>● Product Of Sum Simplification</li> </ul>
<b>Week 7</b>	<ul style="list-style-type: none"> <li>● Exclusive OR</li> <li>● NAND gates</li> <li>● NOR gates</li> </ul>
<b>Week 8</b>	Medterm
<b>Week 9</b>	<ul style="list-style-type: none"> <li>● Two- and Three-Variables Karnaugh Maps.</li> <li>● Four Variables Karnaugh Maps.</li> </ul>
<b>Week 10</b>	Quine-McCluskey method
<b>Week 11</b>	Combinational Logic: Adder, Subtractor Comparators, Decoders and Encoders
<b>Week 12</b>	Multiplexers (Data Selectors). and DE multiplexers
<b>Week 13</b>	Sequential Logic and Latches
<b>Week 14</b>	Applied Logic
<b>Week 15</b>	Memory and Programmable logic

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Codes and conversion among them
<b>Week 2</b>	Codes and conversion among them1
<b>Week 3</b>	Boolean expression
<b>Week 4</b>	Logic gates
<b>Week 5</b>	Circuit Design
<b>Week 6</b>	Second month exam
<b>Week 7</b>	NAND gates & NOR gates
<b>Week 8</b>	Sum of product form

<b>Week 9</b>	Product Of sum form
<b>Week 10</b>	K-map

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	An Introduction to Logic Technology by Luoish Nashlsky	Yes
<b>Recommended Texts</b>	Fundamentals of logic design by J. Roth	No
<b>Websites</b>		

<b>Grading Scheme</b> مخطط الدرجات				
<b>Group</b>	<b>Grade</b>	<b>التقدير</b>	<b>Marks %</b>	<b>Definition</b>
<b>Success Group</b> <b>(50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 - 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	راسب	(0-44)	Considerable amount of work required
<p><b>Note:</b> Marks 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.</p>				



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				معلومات المادة الدراسية	
Module Title	Data Science		Module Delivery		
Module Type	C		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar		
Module Code	AIDC125				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1	Semester of Delivery	2		
Administering Department	AI	College	Type College Code		
Module Leader	Name	e-mail	E-mail		
Module Leader's Acad. Title	Associate Professor	Module Leader's Qualification	Ph.D.		
Module Tutor	Ahmed J. Aljaaf	e-mail	a.j.aljaaf@uoanbar.edu.iq		
Peer Reviewer Name	Name	e-mail	E-mail		
Scientific Committee Approval Date	21/10/2023	Version Number	1.0		

Relation with other Modules				العلاقة مع المواد الدراسية الأخرى	
Prerequisite module	AIDC111	Semester	1		
Co-requisites module		Semester			

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This course has been designed to help learners to understand the core concepts and applications of Data Science and Familiarize them with essential data manipulation and visualization techniques. Various data sources and collection methods will be

	explored in this course to enable learners develop skills in data cleaning and preprocessing. It is anticipated that learners, at the end of this course, will be able to effectively communicate data insights and build data narratives by creating reports and visualizations for data communication.
<b>Module Learning Outcomes</b>  مخرجات التعلم للمادة الدراسية	Upon completion of this comprehensive Data Science course, learners will have achieved a diverse set of learning outcomes. They will have a solid understanding of the core principles of data science, enabling them to proficiently collect, clean, and explore data for analysis. Learners will develop strong data visualization skills, including advanced techniques, and will be able to apply statistical and probability concepts to perform robust data analysis. Furthermore, by the end of this course, learners will have the knowledge and skills needed to communicate their findings effectively and present data insights in a compelling manner. The capstone project will serve as a practical application of their skills, allowing them to tackle real-world data science challenges and showcase their problem-solving abilities.
<b>Indicative Contents</b>  المحتويات الإرشادية	<ul style="list-style-type: none"> <li>● Definition and scope of Data Science.</li> <li>● Data preprocessing: encoding, scaling, and normalization.</li> <li>● Data cleaning techniques: handling missing data, data formatting.</li> <li>● Descriptive statistics: mean, median, variance, skewness.</li> <li>● Exploratory data analysis techniques: box plots, scatter plots, histograms.</li> <li>● Correlation Analysis, Analysis of variance, and Non-parametric statistical tests.</li> <li>● Time series data exploration.</li> <li>● Data extraction and manipulation using SQL.</li> <li>● Data wrangling techniques: filtering, merging, pivoting</li> <li>● Ethical considerations in data collection and analysis.</li> <li>● Building data narratives and reports.</li> <li>● Applying data science skills to a real-world project.</li> </ul>

<b>Learning and Teaching Strategies</b>	
استراتيجيات التعلم والتعليم	
<b>Strategies</b>	Hands-on Practical Exercises Case Studies and Real-World Examples Collaborative Learning Continuous Assessment and Feedback

<b>Student Workload (SWL)</b>	الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا
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<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	93	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>		

<b>Module Evaluation</b>					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects / Lab.</b>	1	5% (5)	Continuous	All
	<b>Report</b>	1	5% (5)	13	LO #5, #8 and #10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	20% (20)	7	LO #1 - #7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b>	
المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Introduction to Data Science
<b>Week 2</b>	Data and information
<b>Week 3</b>	Data analytics Lifecycle

<b>Week 4</b>	Data Collection and Cleaning
<b>Week 5</b>	Exploratory Data Analysis (EDA)
<b>Week 6</b>	Data Visualization
<b>Week 7</b>	Statistical Analysis
<b>Week 8</b>	Time Series Analysis
<b>Week 9</b>	Data Wrangling
<b>Week 10</b>	Feature Engineering
<b>Week 11</b>	Data Ethics and Privacy
<b>Week 12</b>	Data Storytelling and Communication
<b>Week 13</b>	Capstone Project
<b>Week 14</b>	SQL and Databases for Data Science
<b>Week 15</b>	Project Presentations and Wrap-up

### Delivery Plan (Weekly Lab. Syllabus)

#### المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Data Collection and Cleaning
<b>Week 2</b>	Exploratory Data Analysis (EDA)
<b>Week 3</b>	Data Visualization
<b>Week 4</b>	Statistical Analysis
<b>Week 5</b>	Time Series Analysis
<b>Week 6</b>	Data Wrangling
<b>Week 7</b>	Feature Engineering
<b>Week 8</b>	Data Ethics and Privacy

<b>Week 9</b>	Data Storytelling and Communication
<b>Week 10</b>	Capstone Project

<b>Learning and Teaching Resources</b>		
مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Introducing Data Science, Davy Cielen, Anro DB Meysman, Mohamed Ali	No
<b>Recommended Texts</b>	Data Science Job: How to Become a Data Scientist, Przemek Chojcki	No
<b>Websites</b>		

<b>Grading Scheme</b>				
مخطط الدرجات				
<b>Group</b>	<b>Grade</b>	<b>التقدير</b>	<b>Marks %</b>	<b>Definition</b>
<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	راسب	(0-44)	Considerable amount of work required

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Arabic Language I		Module Delivery
Module Type	S		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOA001		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	2	Semester of Delivery	
Administering Department	AI	College	Type College Code
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives	- تعليم الطلبة على أساسيات اللغة العربية وقواعدها - تعليم الطلبة على كيفية الأعراب -
أهداف المادة الدراسية	

<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ul style="list-style-type: none"> <li>- أن يتعرف الطالب على قواعد اللغة العربية</li> <li>- أن يعرف الطالب كيفية بناء الجمل واستخراجها للعنوان المطلوب</li> <li>- القدرة على استعمال العبارات الصحيحة</li> <li>- القدرة على مشاركة الآخرين في الحوار الصحيح</li> </ul>
<b>Indicative Contents</b> المحتويات الإرشادية	

<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<ul style="list-style-type: none"> <li>- مشاركة بالتحضير في قاعة الدرس</li> <li>- طريقة الأسئلة والأجوبة في قاعة الدرس</li> <li>- ادارة المحاضرة عل نحو تطبيقي مرتبط بواقع الحياة اليومية</li> <li>- تكليف الطالب ببعض الأنشطة والواجبات</li> </ul>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>50</b>		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
	<b>Quizzes</b>	2	10% (10)	5 and 10	LO #1, #2 and #10, #11

Formative assessment	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.				
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	20% (20)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	Material Covered
Week 1	العدد تنكيه وتانيته
Week 2	الاعداد المفردة والمركبة
Week 3	ألفاظ العقود والأعداد (مئة، ألف، مليون)
Week 4	تعريف العدد وتنكيه
Week 5	ما يصاغ من العدد على وزن فاعل
Week 6	كتابة الهمزة المتوسطة والمتطرفة
Week 7	امتحان
Week 8	كتابة الالف اللينة
Week 9	كتابة التاء المربوطة والمبسوطة
Week 10	كتابة الضاد والطاء
Week 11	اللامات وأنواعها
Week 12	الهاءات وأنواعها
Week 13	النونات وأنواعها
Week 14	استعمالات (ما، من، والفرق بين (أما، إما)
Week 15	استعمالات (أن، إن)



Week 16	الامتحان النهائي
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Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	- قواعد اللغة العربية، يوسف الصيداوي	لا
Recommended Texts		
Websites		

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
<p><b>Note:</b> Marks 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.</p>				

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	The Crimes of Ba'ath Regime in Iraq		Module Delivery
Module Type	S		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code			
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	2	Semester of Delivery	
Administering Department	AI	College	Type College Code
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives	-

أهداف المادة الدراسية	
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	-
<b>Indicative Contents</b> المحتويات الإرشادية	

<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	-

<b>Student Workload (SWL)</b> الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطلاب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطلاب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطلاب خلال الفصل	50		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		<b>Time/Number</b>	<b>Weight (Marks)</b>	<b>Week Due</b>	<b>Relevant Learning Outcome</b>
<b>Formative assessment</b>	<b>Quizzes</b>				
	<b>Assignments</b>				

	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam				
	Final Exam				
Total assessment			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Week 16	
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Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	-	
Recommended Texts		
Websites		

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:** Marks 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.



# University of Anbar Diploma Supplement

Anbar, Ramadi, Iraq

Phone No.:

e-mail: [Contact@uoanbar.edu.iq](mailto:Contact@uoanbar.edu.iq)

URL: <https://www.uoanbar.edu.iq/>



This Diploma Supplement follows the model developed by the European Commission, Council of Europe and UNESCO/CEPES. The purpose of the supplement is to provide sufficient independent data to improve the international 'transparency' and fair academic and professional recognition of qualifications (diplomas, degrees, certificates etc.). It is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended. It should be free from any value judgements, equivalence statements or suggestions about recognition. Information in all sections should be provided. Where information is not provided, an explanation should give the reason why.

## 1. INFORMATION IDENTIFYING THE HOLDER OF THE QUALIFICATION

- 1.1 First Name:
- 1.2 Second Name:
- 1.3 Third Name:
- 1.4 Date of Birth:
- 1.5 Place of Birth:
- 1.6 Student Identification Number:
- 1.7 National ID number:

## 2. INFORMATION IDENTIFYING THE QUALIFICATION

- 2.1 Name of the Qualification:
- 2.2 Main Field of the Study of the Qualification:
- 2.3 Name and Status of the Awarding Institution:
- 2.4 Language of Instruction/ Examination:

## 3. INFORMATION ON THE LEVEL OF QUALIFICATION

- 3.1 Level of Qualification

**First Cycle (Bachelor's Degree)**

- 3.2 Official Length of the Programme

**4 years – 8 Semesters**

- 3.3 Access Requirements

**High School Diploma – Placement through the National Central Admission Requirements**

#### 4. INFORMATION ON THE CONTENTS AND RESULTS GAINED

##### 4.1 Study System:

**Bologna process**

##### 4.2 Mode of Study

**First Cycle (Bachelor's Degree)**

##### 4.3 Program Requirements

**A Student is required to have a minimum CGPA of 50% and no falling grades**

##### 4.4 Minimum Credits for Semester, Year and Graduation (ECTS)

**30 ECTS/Semester | 60 ECTS/Year | 240 ECTS/Programme | 1 ECTS = 25 hrs**

##### 4.5 Student Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

#### 4.6 Programme Details and the Individual Grade/Marks Obtained

Module Code	Module Name	Type	Mark Grade	ECTS	
<b>Semester 1</b>					
AIDC113	Computer Technology	Core		5	
AIDC112	Programming Basics	Core		9	
AIDC111	Introduction to Artificial Intelligence (AI)	Core		6	
CCIT060	Mathematics	Basic		6	
UOA003	English Language I	Support		2	
UOA005	Democracy and Human Rights	Support		2	
Grade Point Average (GPA) = ( - )				Total ECTS	30
<b>Semester 2</b>					
CCIT061	Discrete Mathematics	Basic		6	
AIDC123	Structured Programming	Core		8	
AIDC124	Logic Design	Core		6	
AIDC125	Data Science	Core		6	
UOA001	Arabic Language I	Support		2	
UOA006	The Crimes of Ba'ath Regime in Iraq	Support		2	
Grade point Average (GPA) = ( - )				Total ECTS	30
<b>Semester 3</b>					
AIDC210	Advanced Object Oriented Programming	Core		6	
CCIT062	Numerical Analysis	Basic		5	
AIDC213	Basics of Object Oriented Programming	Core		7	
AIDC212	Computational Theory	Core		5	
AIDC214	Python Programming Language	Core		5	
UOA002	Arabic Language II	Support		2	
Grade Point Average (GPA) = ( - )				Total ECTS	30
<b>Semester 4</b>					
AIDC222	Computational Theory	Core		8	
AIDC223	Algorithms and Data Structures	Core		7	
AIDC224	Machine Learning Basics	Core		6	
AIDC225	Artificial Intelligence Algorithms	Core		7	
UOA004	English Language 2	Support		2	
GPA = ( - )				Total ECTS	30
<b>Semester 5</b>					
AIDC311	Compilers	Core		5	
AIDC312	Computer Architecture	Core		4	
CCIT063	Computer Networks	Basic		6	
AIDC314	Optimization Problems	Core		6	
AIDC315	Web Applications	Core		4	
AIDC316	Advance Machine Learning	Core		5	
Grade Point average (GPA) = ( - )				Total ECTS	30



**Semester 6**

AIDC321	Information Retrieval	Core	5
AIDC322	Databases	Core	6
AIDC323	Metaheuristic	Core	7
AIDC324	Deep Learning	Core	7
AIDC325	Computer Security	Core	5

Grade Point Average (GPA) = ( - ) Total ECTS 30

**Semester 7**

AIDC411	Operating Systems	Core	6
AIDC412	Data Mining	Core	7
AIDE413	Games Development	Elective	6
UOA019	Research Methodology	Support	4
AIDC415	Robotics	Core	7

Grade Point Average (GPA) = ( - ) Total ECTS 30

**Semester 8**

AIDC421	Natural Languages Processing (NLP)	Core	5
AIDC422	Digital Forensics	Core	4
AIDC423	Pattern Recognition	Core	5
AIDC424	Big Data	Core	4
AIDC425	Recommendation Systems	Core	4
UOA020	Project	Support	8

Grade Point Average (GPA) = ( - ) Total ECTS 30

**Cumulative Grade Point Average (CGPA) = Programme total ECTS 240**

## 4.7 Grading Scheme and Grade Distribution Guidance

Group	Grade	Marks	Definitions
Success Group (50 - 100)	A - Excellent	90 - 100	Outstanding Performance
	B - Very Good	80 - 89	Above average with some errors
	C - Good	70 - 79	Sound work with notable errors
	D - Satisfactory	60 - 69	Fair but with major shortcomings
	E - Sufficient	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	F - Fail	00 - 49	Considerable amount of work required

Marks with 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.

4.8 Overall Classification of the Qualification

**Cumulative Grade Point Average (CGPA) =**

**Final Grade of Degree relative RANK: 4 of 23**

## 5. INFORMATION ON THE FUNCTION OF THE QUALIFICATION

5.1 Access to Further Study

**May apply to second cycle programs**

5.2 Professional Status Conferred

**The degree enables the graduate to exercise the profession**

## 6. ADDITIONAL INFORMATION

6.1 Additional Information

**University of Anbar, College of Computer Science and Information Technology,  
Department of AI**

6.2 Further Information Sources

**University Website** <https://uoanbar.edu.iq/>

**Registration Office e-mail** [xxxxx@uoanbar.edu.iq](mailto:xxxxx@uoanbar.edu.iq)

## 7. CERTIFICATION OF THE SUPPLEMENT

7.1 Date **01.10. 2027**

7.2 Name **Full Name**

7.3 Capacity **University General Registrar**

7.4 Signature

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7.5 Official Stamp and Seal

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## Structure and Degree System

The basic structure of the Iraqi National Education System consists of stages of noncompulsory pre-school education; Compulsory primary (elementary and middle school) and secondary (high school) education; and higher education. Primary education begins at the age of 6 years (72 months), lasts nine years and comprises six years of elementary and three years of middle school education. Secondary education is three years and divided into two categories as "General High School Education" and "Vocational and Technical High School Education". The entry into these categories is through composite scores obtained from centralized exam of secondary schools.

Higher Education System is managed by the Ministry of Higher Education and Scientific Research which is responsible for the planning, coordination, governance and supervision of higher education within the provisions set forth in the Constitution of the Republic of Iraq and Higher Education Law. Both state and private universities are founded by law and subjected to the higher education law and to the regulations enacted in accordance with it.

Higher Education in Iraq comprises all post-secondary higher education programs, consisting of short, first, second and third cycle degrees in terms of the terminology of the Bologna Process. Except for the Architectural Engineering, Pharmacy, Dentistry and Veterinary programs, which are five years (300 ECTS), and Medicine Programme which is six years (360 ECTS), the duration of the first cycle (Bachelor degree) is a full-time four years (240 ECTS) study. The duration of the short cycle (Technical Diploma) is a full-time two years (120 ECTS) study.

Graduate level of Study consists of second cycle (master) and third cycle (doctorate) degree programs. The second cycle is a master with thesis with duration of two years (120 ECTS). Third cycle (doctorate) degree programs are completed having earned a minimum of 180 ECTS credits., which consists of completion of courses, passing a proficiency examination and doctoral thesis.

