

COMSATS University Islamabad

Registrar Secretariat, Academic Unit (PS)

No. CUI-Reg/Notif- 4757/21/3432

December 17, 2021

NOTIFICATION

Scheme of Studies of Bachelor of Science in Artificial Intelligence

Academic Council in its 32nd meeting held on October 06, 2021, on the recommendation of 28th meeting of Board of Faculty of Information Sciences and Technology, approved the revised Scheme of Studies of Bachelor of Science in Artificial Intelligence BS (AI) effective from Spring 2022 at CUI system:

Nomenclature: Bachelor of Science in Artificial Intelligence BS (AI)

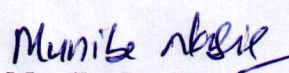
1. Minimum Duration: 04 Years
2. Minimum No. of Semesters: 08

3. Course Work

- a) General Education
- b) University Electives
- c) Mathematics & Science Foundation
- d) Computing Core
- e) Computer Science Core
- f) AI Core (Domain Core)
- g) AI Electives (Domain Electives)

	(Min No. of Courses)	(Min No. of Credit Hours)
a) General Education	07	21
b) University Electives	04	12
c) Mathematics & Science Foundation	04	12
d) Computing Core	11	39
e) Computer Science Core	05	18
f) AI Core (Domain Core)	06	18
g) AI Electives (Domain Electives)	04	12
Minimum No. of Courses Required:	41	--
Minimum No. of Credit Hours Required:		132

Note: The Regulations relating to Undergraduate Degree Programs approved by the Competent Authority and amended from time to time shall be applicable.


Muniba Nasir
Additional Registrar

Encl: (Total 31 pages including this page)

Distribution:

1. All Campus Directors, CUI
2. Dean, Faculty of Information Sciences and Technology, CUI
3. Controller of Examinations, CUI
4. Chairperson, Department of Computer Science, CUI
5. Incharge QEC/CU Online, PS
6. All HoDs/Incharge of Academics/Examinations Sections, CUI Campuses
7. Internal distribution, Registrar Office (Academic Unit), CUI

Cc:

1. PS to Rector CUI
2. PS to Registrar CUI

General Education

Subject/Knowledge Area	Credit Hours	Contact Hours
Introduction to Info. & Comm. Technologies	3(2-1)	2-3
English Composition & Comprehension	3(3-0)	3-0
Communication & Presentation Skills	3(3-0)	3-0
Technical & Business Writing	3(3-0)	3-0
Islamic Studies/ Ethics	3(3-0)	2-0
Pakistan Studies	3(3-0)	2-0
Professional Practices	3(3-0)	3-0

University Elective

Subject/Knowledge Area	Credit Hours	Contact Hours
Foreign Language	3(3-0)	3-0
Management Related	3(3-0)	3-0
Social Science Related	3(3-0)	3-0
Economy Related	3(3-0)	3-0

Mathematics and Science Foundation

Subject/Knowledge Area	Credit Hours	Contact Hours
Calculus & Analytic Geometry	3(3-0)	3-0
Linear Algebra	3(3-0)	3-0
Probability & Statistics	3(3-0)	3-0
Differential Equations	3(3-0)	3-0

Computing Core

Subject/Knowledge Area	Credit Hours	Contact Hours
Programming Fundamentals	4(3-1)	3-3
Discrete Structures	3(3-0)	3-0
Object Oriented Programming	4(3-1)	3-3
Database Systems	4(3-1)	3-3
Data Structures & Algorithms	4(3-1)	3-3
Information Security	3(3-0)	3-0
Computer Networks	4(3-1)	3-3
Operating Systems	4(3-1)	3-3
Software Engineering Concepts	3(3-0)	3-0
Final Year Project – I	2(0-2)	0-6
Final Year Project – II	4(0-4)	0-12

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Computer Science Core

Subject/Knowledge Area	Credit Hours	Contact Hours
Artificial Intelligence	4(3-1)	3-3
Digital Logic Design	4(3-1)	3-3
Analysis of Algorithms	3(3-0)	3-0
Computer Organization & Assembly Language	4(3-1)	3-3
Parallel & Distributed Computing	3(2-1)	2-3

Artificial Intelligence Core

Subject/Knowledge Area	Credit Hours	Contact Hours
Programming for Artificial Intelligence	3(2-1)	2-3
Machine Learning	3(2-1)	2-3
Artificial Neural Networks	3(2-1)	2-3
Knowledge Representation & Reasoning	3(3-0)	3-0
Computer Vision	3(2-1)	2-3
Natural Language Processing	3(3-0)	3-0

Artificial Intelligence Electives

Subject/Knowledge Area	Credit Hours	Contact Hours
Advance Statistics	3(3-0)	3-0
Theory of Automata & Formal Languages	3(3-0)	3-0
Data Mining	3(2-1)	2-3
Deep Learning	3(3-0)	3-0
Speech Processing	3(3-0)	3-0
Reinforcement Learning	3(3-0)	3-0
Fuzzy Systems	3(3-0)	3-0
Evolutionary Computing	3(3-0)	3-0
Swarm Intelligence	3(3-0)	3-0
Agent Based Modeling	3(3-0)	3-0
Knowledge Based Systems	3(3-0)	3-0
Robotics	3(3-0)	3-0

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General Education

Course Code	Course Title	Credit Hours	Pre-requisite(s)
CSC101	Introduction to ICT	3(2,1)	-
AIC410	Professional Practices in AI	3(3,0)	-
HUM100	English Comprehension and Composition	3(3,0)	-
HUM102	Report Writing Skills	3(3,0)	HUM100
HUM103	Communication Skills	3(3,0)	HUM100
HUM110	Islamic Studies **	3(3,0)	-
HUM111	Pakistan Studies	3(3,0)	-

**Non-Muslim students can opt for HUM114 Ethics 3(3, 0) course in lieu of HUM110 Islamic Studies, if they intend to.

University Electives (Any 4 courses)

Course Code	Course Title	Credit Hours	Pre-requisite(s)
MGT100	Introduction to Business	3(3,0)	-
MGT101	Introduction to Management	3(3,0)	-
MGT131	Financial Accounting	3(3,0)	-
MGT210	Fundamentals of Marketing	3(3,0)	-
MGT350	Human Resource Management	3(3,0)	-
MGT513	New Product Development	3(3,0)	-
ECO300	Engineering Economics	3(3,0)	-
ECO400	Business Economics	3(3,0)	-
ECO403	Managerial Economics	3(3,0)	-
ECO111	Principles of Microeconomics	3(3,0)	-
ECO484	Project Planning and Monitoring	3(3,0)	-
HUM220	Introduction to Psychology	3(3,0)	-
HUM221	International Relations	3(3,0)	-
HUM320	Introduction to Sociology	3(3,0)	-
HUM430	French	3(3,0)	-
HUM431	German	3(3,0)	-
HUM432	Arabic	3(3,0)	-
HUM433	Persian	3(3,0)	-
HUM434	Chinese	3(3,0)	-
HUM435	Japanese	3(3,0)	-

Mathematics & Science Foundation

Course Code	Course Title	Credit Hours	Pre-requisite(s)
MTH104	Calculus and Analytic Geometry	3(3,0)	-
MTH262	Statistics and Probability Theory	3(3,0)	-
MTH242	Differential Equations	3(3,0)	MTH104
MTH231	Linear Algebra	3(3,0)	-

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Computing Core

Course Code	Course Title	Credit Hours	Pre-requisite(s)
CSC103	Programming Fundamentals	4(3,1)	-
CSC102	Discrete Structures	3(3,0)	-
CSC211	Data Structures and Algorithms	4(3,1)	CSC103
CSC241	Object Oriented Programming	4(3,1)	CSC103
CSC270	Database Systems	4(3,1)	CSC211
CSC323	Principles of Operating Systems	4(3,1)	CSC211
CSC291	Software Engineering Concepts	3(3,0)	-
CSC340	Computer Networks	4(3,1)	-
CSC432	Information Security	3(3,0)	-
AIC498	Final Year Project-I*	2(0,2)	CSC291, HUM102
AIC499	Final Year Project-II	4(0,4)	AIC498

**Final Year Project-I will be graded independently*

Computer Science Core Courses

Course Code	Course Title	Credit Hours	Pre-requisite(s)
AIC262	Introduction to Artificial Intelligence	4(3,1)	-
CSC301	Design and Analysis of Algorithms	3(3,0)	CSC211
CSC325	Computer Organization & Assembly Language	4(3,1)	
CSC334	Parallel and Distributed Computing	3(2,1)	CSC323
EEE241	Digital Logic Design	4(3,1)	-

Artificial Intelligence Core

Course Code	Course Title	Credit Hours	Pre-requisite(s)
AIC270	Programming for Artificial Intelligence	3(2,1)	CSC103
AIC354	Machine Learning Fundamentals	3(2,1)	AIC270
AIC372	Knowledge Representation and Reasoning	3(3,0)	AIC262
AIC380	Artificial Neural Networks	3(2,1)	AIC262
AIC341	Introduction to Computer Vision	3(2,1)	MTH231
AIC365	Natural Language Processing	3(3,0)	-

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Artificial Intelligence Electives (Any 4 Courses)

Course Code	Course Title	Credit Hours	Pre-requisite(s)
AIC333	Statistical Methods for AI	3(3,0)	-
CSC312	Theory of Automata	3(3,0)	CSC102
DSC306	Data Mining	3(2,1)	-
AIC467	Deep Learning	3(3,0)	-
AIC378	Speech Processing	3(3,0)	-
AIC456	Reinforcement Learning	3(3,0)	-
AIC468	Fuzzy Systems	3(3,0)	-
AIC469	Evolutionary Computing	3(3,0)	-
AIC471	Swarm Intelligence	3(3,0)	-
AIC332	Agent Based Modeling	3(3,0)	-
AIC470	Knowledge Based Systems	3(3,0)	-
CSC421	Robotics	3(3,0)	-
CSC303	Mobile Application Development	3(2,1)	CSC241
CSC336	Web Technologies	3(2,1)	CSC241
CSC337	Advanced Web Technologies	3(2,1)	CSC336
CSC412	Visual Programming	3(2,1)	CSC241
CSC417	E-Commerce and Digital Marketing	3(2,1)	-
CSC418	DevOps for Cloud Computing	3(2,1)	-
CSC335	Game Design	3(3,0)	-
CSC353	Computer Graphics	3(2,1)	MTH231
CSC356	Human Computer Interaction	3(2,1)	-
CSC495	Game Development	4(3,1)	CSC241
CSC496	Game Engine Development	3(2,1)	CSC495
AIC480	Topics in AI	3(3,0)	-

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Tentative Study Plan for BS (AI)

Below is a tentative eight semester study plan of course offerings. A campus may change the offerings depending upon their available resources.

Semester – 1				
S#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1	CSC101	Introduction to ICT	3(2, 1)	
2	HUM100	English Comprehension and Composition	3(3, 0)	
3	HUM110	Islamic Studies	3(3, 0)	
4	HUM111	Pakistan Studies	3(3, 0)	
5	MTH100	Mathematics I*	3(3, 0)	
6		University Electives 1/4		

Semester – 2				
S#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1	CSC103	Programming Fundamentals	4(3, 1)	
2	HUM102	Report Writing Skills	3(3, 0)	HUM100
3	EEE241	Digital Logic Design	4(3, 1)	
4	CSC102	Discrete Structures	3(3, 0)	
5	MTH101	Calculus I*	3(3, 0)	
6	CSC291	Software Engineering Concepts	3(3, 0)	

Semester – 3				
S#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1	CSC241	Object Oriented Programming	4(3, 1)	CSC103
2	HUM103	Communication Skills	3(3, 0)	HUM100
3	MTH231	Linear Algebra	3(3, 0)	
4	MTH104	Calculus and Analytic Geometry	3(3, 0)	
5	AIC262	Introduction to Artificial Intelligence	4(3, 1)	

Semester – 4				
S#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1	CSC211	Data Structures and Algorithms	4(3, 1)	CSC103
2	CSC340	Computer Networks	4(3, 1)	
3	CSC325	Computer Organization and Assembly Language	4(3, 1)	
4	AIC270	Programming for Artificial Intelligence	3(2, 1)	CSC103
5		University Electives 2/4		

Semester – 5				
S#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1	CSC270	Database Systems	4(3, 1)	CSC211
2	CSC323	Principles of Operating Systems	4(3, 1)	CSC211
3	AIC410	Professional Practices in AI	3(3, 0)	
4	MTH262	Statistics and Probability Theory	3(3, 0)	
5	AIC372	Knowledge Representation and Reasoning	3(3, 0)	AIC262
6		Artificial Intelligence Elective Courses 1/4		

Semester – 6				
S#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1	MTH242	Differential Equations	3(3, 0)	MTH104
2	CSC301	Design and Analysis of Algorithms	3(3, 0)	CSC211
3	CSC334	Parallel and Distributed Computing	3(2, 1)	CSC323
4	AIC354	Machine Learning Fundamentals	3(2, 1)	AIC270
5	AIC365	Natural Language Processing	3(3, 0)	
6		Artificial Intelligence Elective Courses 2/4		

Semester – 7				
S#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1	CSC432	Information Security	3(3, 0)	
2	AIC380	Artificial Neural Networks	3(2, 1)	AIC262
3	AIC498	Final Year Project-I	2(0, 2)	CSC291, HUM102
4	AIC341	Introduction to Computer Vision	3(2, 1)	MTH231
5		Artificial Intelligence Elective Courses 3/4		

Semester – 8				
S#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1	AIC499	Final Year Project-II	4(0, 4)	AIC498
2		University Electives 3/4		
3		University Electives 4/4		
4		Artificial Intelligence Elective Courses 4/4		

* Non-Credit course. Students with **Pre-Medical background** must have to pass deficiency courses of Mathematics (MTH100 and MTH 101) of 06 credit hours within one year.