COMSATS University Islamabad
Registrar Office, Academic Unit (PS)
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No: CUI-Reg/Notif-1349/24/1393 May 30, 2024

NOTIFICATION

Academic Council through email circulation on May 24, 2024, has approved the following Scheme of Studies of Bachelor of Science in Economics with Data Science, effective from Fall 2024

1. Nomenclature for BS Degree: **Bachelor of Science in Economics with Data Science**

Minimum Duration:	04 Years	Minimum Semesters:	08	Minimum Credit Hours required:	132

2. **Framework of Courses and Credit Hours for Degree Program**

Sr. No.	Course Work	No. of Courses	Credit Hours
a)	General Education Courses	12	30
b)	Major Discipline Courses		
	i. Economics Discipline Courses	18	54
	ii. Data Science Discipline Courses	08	27
c)	Interdisciplinary Courses	04	12
d)	Internship	01	03
e)	Capstone Project	02	06
Total No. of Courses & Credit Hours of the Program		**45**	**132**

Note: Common policies and procedures notified vide No. CUI-Reg/Notif-1794/23/1884, dated August 25, 2023, relating to Undergraduate Degree Programs approved by the Competent Authority, and amended from time to time shall be applicable.

Dr. Muhammad Hanif
Deputy Registrar

Distribution:
1. All Directors, CUI
2. All Deans, CUI
3. Incharge Islamabad Campus, CUI
4. Controller of Examinations, CUI
5. All Chairpersons, CUI
6. All HoDs/Incharge of Academics/Examinations Sections, CUI Campuses
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1. PS to Rector CUI
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General Education Courses:

i. **Arts and Humanities** (any one course from the following list)

Sr#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	ARC190	Art Appreciation	2(2, 0)	
2.	CSC210	Professional Practices	2(2, 0)	
3.	HUM107	21st Century Communication Skills	2(2, 0)	
4.	HUM123	Fundamentals of Philosophy	2(2, 0)	

ii. **Natural Sciences** (any one course from the following list)

Sr#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	BIO100	Fundamentals of Biology	3(2, 1)	
2.	BIO231	Fundamentals of Genetics	3(2, 1)	
3.	BIO310	Introduction to Bioinformatics	3(2, 1)	
4.	ERS101	Physical Geology	3(2, 1)	
5.	FSN246	Contemporary Nutrition	3(2, 1)	
6.	MET107	Principles of Geographic Information System	3(2, 1)	
7.	PHY124	Applied Physics	3(2, 1)	
8.	CHM101	General Chemistry	3(3, 0)	

iii. **Social Sciences** (any one course from the following list)

Sr#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	DEV112	A Science of Society I	2(2, 0)	
2.	HUM122	Fundamentals of Psychology	2(2, 0)	
3.	HUM130	Fundamentals of Sociology	2(2, 0)	
4.	HUM131	Anthropology	2(2, 0)	
5.	HUM209	Fundamentals of Political Science	2(2, 0)	
6.	HUM222	Fundamentals of International Relations	2(2, 0)	

iv. **Functional English** (Mandatory course)

Sr#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	HUM100	English Comprehension andComposition	3(3, 0)	
2.	HUM104	Functional English	3(3, 0)	

v. **Expository Writing** (Mandatory course)

	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	HUM102	Report Writing Skills	3(3, 0)	

2.	HUM120	Expository Writing	3(3, 0)	-
3.	HUM121	Technical and Business Writing	3(3, 0)	

vi. **Quantitative Reasoning** (Mandatory courses)

Sr#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	MTH103	Exploring Quantitative Skills	3(3, 0)	-
2.	MTH114	Tools for Quantitative Reasoning	3(3, 0)	MTH103

vii. **Islamic Studies/Ethics** (Mandatory course. HUM116 Ethics is only for Non-Muslim Students)

Sr#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	HUM112	Islamic Studies	2(2, 0)	-
2.	HUM116	Ethics	2(2, 0)	-

viii. **Ideology and Constitution of Pakistan** (Mandatory course)

Sr#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	HUM113	Ideology and Constitution of Pakistan	2(2, 0)	

ix. **Application of Information and Communication Technologies** (Mandatory course)

Sr#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	CSC101	Applications of Information and Communication Technologies	3(2, 1)	

x. **Entrepreneurship** (Mandatory course)

Sr#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	MGT250	Introduction to Entrepreneurship	2(2, 0)	

xi. **Civics and Community Engagement** (Mandatory course)

Sr#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	HUM208	Civics and Community Engagement	2(2, 0)	

List of Major Discipline Courses:

i. **Economics Discipline Courses** (Mandatory courses)

#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	ECO110	Mathematics for Economists	3(3, 0)	-
2.	ECO113	Microeconomics I	3(3, 0)	-
3.	ECO122	Macroeconomics I	3(3, 0)	-
4.	ECO200	Introduction to Development Economics	3(3, 0)	-
5.	ECO210	Statistics for Economists	3(3, 0)	-
6.	ECO212	Economics of Pakistan	3(3, 0)	-
7.	ECO214	Microeconomics II	3(3, 0)	ECO113
8.	ECO223	Macroeconomics II	3(3, 0)	ECO122

9.	ECO232	Basic Econometrics	3(3, 0)	ECO210
10.	ECO250	Linear Algebra for Economists	3(3, 0)	-
11.	ECO333	Applied Econometrics	3(3, 0)	ECO232
12.	ECO346	Data Visualization Techniques for Economists	3(2, 1)	-
13.	ECO347	Financial Markets and Institutions	3(3, 0)	-
14.	ECO420	Data Science for Economists	3(3, 0)	-
15.	ECO422	Economic Data Analytics	3(2, 1)	-
16.	ECO441	Labor Economics	3(3, 0)	-
17.	ECO450	General Equilibrium and Welfare Economics	3(3, 0)	-
18.	ECO476	International Monetary System	3(3, 0)	-

ii. **Data Science Discipline Courses** (Mandatory courses)

#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	CSC103	Programming Fundamentals	4(3, 1)	-
2.	CSC211	Data Structures and Algorithms	4(3, 1)	CSC103
3.	CSC241	Object Oriented Programming	4(3, 1)	CSC103
4.	CSC262	Artificial Intelligence	3(2, 1)	-
5.	DSC293	Data Science Fundamentals	3(2, 1)	-
6.	AIC354	Machine Learning Fundamentals	3(2, 1)	-
7.	AIC380	Artificial Neural Networks and Deep Learning	3(3, 0)	CSC262
8.	DSC407	Platform and Architecture for Data Science	3(3, 0)	-

B. List of Interdisciplinary/Allied Courses (Any four courses from the following list)

#	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	ACC300	Contemporary Taxation	3(3, 0)	
2.	ACC478	Business Taxation	3(3, 0)	
3.	DEV342	Local Government System and Rural Development	3(3, 0)	
4.	HUM310	Islamic History	3(3, 0)	

5.	HUM430	French	3(3, 0)	
6.	HUM431	German	3(3, 0)	
7.	HUM432	Arabic	3(3, 0)	
8.	HUM433	Persian	3(3, 0)	
9.	HUM434	Chinese	3(3, 0)	
10.	LAW300	Corporate Law	3(3, 0)	
11.	MET433	Air Pollution and Climate Change	3(3, 0)	
12.	MGT350	Human Resource Management	3(3, 0)	
13.	MGT401	Corporate Governance	3(3, 0)	
14.	FIN485	Technology in Finance	3(3, 0)	
15.	CSC417	E-Commerce and Digital Marketing	3(2, 1)	
16.	STA441	Quantitative Methods for Decision Making	3(3, 0)	

C. Internship (The internship of six to eight weeks (preferably undertaken during semester or summer break after completing 4th semester) is mandatory and must be graded by a faculty member in collaboration with the supervisor in the field)

Sr. No.	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	ECO399	Internship	3(0, 3)	-

D. Capstone Project

Sr. No.	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	ECO497	Capstone Project I	3(0, 3)	-
2.	ECO498	Capstone Project II	3(0, 3)	-

(Economics Discipline Courses)

Course Code: ECO110 **Prerequisite**: None

Course Title: Mathematics for Economists

Credit Hours:3(3,0)

Course Objectives

- To discuss basic linear algebra skills required for analyzing functions with multiple variables, with a focus on economics applications.
- To demonstrate how to use derivatives of functions with multiple variables to identify maximum and minimum values, with relevance to economic analysis.
- To instruct students on solving linear systems and converting them into matrix problems, while also covering important properties of matrices.
- This course will concentrate on linear algebra and multivariable differential calculus topics tailored to economic applications.

Course Contents

The course covers a wide range of contents which include understanding of derivatives, rules of differentiation, partial derivatives, differentials and total differentials, higher order derivatives, their uses and applications in economics; unconstrained and constrained optima for multivariate functions and application of these techniques to solve problems in economics; indefinite integrals and their applications to economic problems; differential equations and difference equations and discussion of related economic problems; matrix and vector operations; solution of systems of equations using matrix algebra and using Jacobian determinants to test for functional dependence.

Recommended Books

1. Mathematical economics, Yu, K, Springer, 2019
2. Fundamental methods of mathematical economics, Chiang, A. C., & Wainwright, K. McGraw-Hill/Irwin, 2005.