



# Course Specification

## **DIPLOMA**

Course Title: **Statistics and Probabilities**

Course Code: **APDA1202**

Program: **Diploma in Data Analytics**

Department: **Diploma Department**

College: **The Applied College**

Institution: **Umm Al-Qura University**

Version: **1**

Last Revision Date: **05 May 2025**



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## A. General information about the course:

### 1. Course Identification

#### 1. Credit hours:

2

#### 2. Course type

- A. ☐ University ☐ College ☒ Department ☐ Track ☐ Others
- B. ☒ Required ☐ Elective

#### 3. Level/year at which this course is offered: Level 2, 1<sup>st</sup> Year

#### 4. Course General Description:

This course provides a comprehensive introduction to the fundamental concepts of probability and statistics, with a focus on their applications in data analytics. Key topics include probability theory, statistical inference, sampling methods, and hypothesis testing. Students will also explore different quantitative research methods and statistical techniques for data analysis. Additionally, the course emphasizes practical implementation by utilizing the open-source statistical programming language, R, to apply these concepts to real-world datasets and analytical problems.

#### 5. Pre-requirements for this course (if any):

None

#### 6. Co-requisites for this course (if any):

None

#### 7. Course Main Objective(s):

- 1) Understand fundamental concepts of probability and statistical analysis relevant to data analytics.
- 2) Perform data preprocessing, summarization, and visualization using statistical techniques and tools.
- 3) Apply statistical methods, including hypothesis testing and sampling, to analyze real-world datasets and derive meaningful insights.
- 4) Collaborate on data-driven projects, applying statistical reasoning to solve problems across various domains
- 5) Apply statistical programming tools to solve real-world problem

### 2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100%
2	E-learning	None	



No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid <ul style="list-style-type: none"> <li>Traditional classroom</li> <li>E-learning</li> </ul>	None	
4	Distance learning	None	

### 3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	
3.	Field	None
4.	Tutorial	None
5.	Others (specify)	None
Total		60

## B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Explain the foundational principles of probability theory, statistical inference, and their applications in data analytics.	K1	Presentations, Discussion	Exams, Assignments
1.2	Identify different types of data, sampling methods, and statistical distributions used in analysis.	K2	Brainstorming, Presentations	Exams, Assignments
1.3	Understand the role of statistical techniques, such as hypothesis testing and regression, in	K3	Presentations, Discussion	Exams, Assignments

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	solving real-world problems.			
<b>2.0</b>	<b>Skills</b>			
2.1	Apply statistical analysis in decision making.	S1	Presentations, Practical Training, Self-learning,	Exams, Assignments, Project
2.2	Conduct probability-based analyses to assess uncertainty and make predictions	S2	Presentations, Practical Training, Self-learning	Exams, Assignments, Project
2.3	Apply hypothesis testing, confidence intervals, and other inferential techniques to analyze datasets.	S3	Presentations, Practical Training, Self-learning	Exams, Assignments, Project
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
3.1	Appreciate the value of data-informed decision-making.	V1	Lectures	Project
3.2	Recognize the ethical use and privacy considerations of data.	V2	Lectures	Project
3.3	Collaborate with peers to explore and solve real-world problems.	V3	Lectures	Project



## C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Statistics and Data	2
2.	Data Organization and Structured Data	2
3.	Measures of Central Tendency	2
4.	Variability and Spread of Data	2
5.	Probability Basics and Distributions	2
6.	Sampling and Sampling Distributions	2
7.	Confidence Intervals	2
8.	Hypothesis Testing Basics	2
9.	Statistical Significance and P-values	2
10.	ANOVA and Chi-Square Tests	2
11.	Variables Between	2
12.	Simple Linear Regression	2
13.	Statistical Tools	2
14.	Data Visualization in (R, Excel, Power BI)	2
15.	Review and wrap up	2
Total		30

## D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Week 3,12	10%
2.	Assignments	10	20%
3.	Midterm Exam	Week 7	20%
4.	Project	Continuous	10%
5.	Final Exam	Week 16	40%

\*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

## E. Learning Resources and Facilities

### 1. References and Learning Resources

#### Essential References

Bruce, P., Bruce, A. and Gedeck, P., 2020. Practical Statistics for Data Scientists. 2nd ed. Sebastopol: O'Reilly Media, Inc. ISBN: 9781492072942

Supportive References	Video Tutorials
Electronic Materials	
Other Learning Materials	R for Data Science: Import, Tidy, Transform, Visualize, and Model Data ISBN-13: 978-1491910399 Hadley Wickham and Garrett Grolemund O'Reilly Media 2017

## 2. Required Facilities and equipment

Items	Resources
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms
<b>Technology equipment</b> (projector, smart board, software)	Data show projector Collab
<b>Other equipment</b> (depending on the nature of the specialty)	R MS BI MS Excel

## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	<b>Indirect</b> Course survey and students' feedback.
Effectiveness of Students	Faculty Members, Peer Reviewers	<b>Direct</b> Report on the satisfaction of exam standards.
Quality of learning resources	Faculty Member, Course Coordinators	<b>Direct</b> Learning resources evaluation survey.



Assessment Areas/Issues	Assessor	Assessment Methods
The extent to which CLOs have been achieved	Faculty Members, Program Leaders	<b>Direct</b> Course reports.
Other		

**Assessors** (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify))

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval

<b>COUNCIL /COMMITTEE</b>	Umm Al-Qura University Council
<b>REFERENCE NO.</b>	851281214463/193664
<b>DATE</b>	1447/01/20

