



Course Specification

DIPLOMA

Course Title: **Advanced Web Analytics**

Course Code: **APDA3211**

Program: **Diploma in Data Analytics**

Department: **Diploma Department**

College: **The Applied College**

Institution: **Umm Al-Qura University**

Version: **2**

Last Revision Date: **17 June 2025**



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A. General information about the course:

1. Course Identification

1. Credit hours:

4

2. Course type

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

3. Level/year at which this course is offered: Level 3, 2nd Year

4. Course General Description:

This course integrates advanced data analytics methods with the development of dynamic, web-based data applications. Students will apply machine learning, statistical modeling, and real-time analytics using Python or R, while leveraging web technologies and platforms such as Power BI, Tableau, and Flask/Dash for deployment. Emphasis is placed on automating workflows, building interactive dashboards, and developing lightweight web apps to communicate analytical insights to stakeholders. The course combines theoretical concepts with intensive lab sessions that simulate real-world data problems and solutions.

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

APDA1205 Introduction to Data Science

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

7. Course Main Objective(s):

Upon completion of the course, students will be able to:

1. Implement advanced analytics techniques using programming languages.
2. Build and deploy interactive dashboards and web applications.
3. Automate data workflows and integrate multiple data sources.
4. Apply web technologies to visualize and communicate analytical outcomes.
5. Demonstrate responsible data practices in web-based analytics environments.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	90	100%
2	E-learning	None	





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

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	60
3.	Field	None
4.	Tutorial	None
5.	Others (specify)	None
Total		90

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	Understand concepts in predictive analytics, machine learning, and data pipelines.	K1	<ul style="list-style-type: none"> Lectures Lab Exercises 	<ul style="list-style-type: none"> Midterm and Final exams Quiz Lab assessment
1.2	Explain the architecture of web-based analytical applications.	K2	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Midterm and Final exams Quiz
2.0	Skills			
2.1	Build end-to-end analytics solutions	S4	<ul style="list-style-type: none"> Project Lab Exercises 	<ul style="list-style-type: none"> Lab exam Project





Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	using Python/R and BI tools.			
2.2	Create interactive dashboards using tools like Power BI, Tableau, or Dash.	S3	<ul style="list-style-type: none"> • Project • Lab Exercises 	<ul style="list-style-type: none"> • Lab exam • Project
2.3	Deploy data-driven web apps and automate data ingestion processes.	S4	<ul style="list-style-type: none"> • Project • Lab Exercises 	<ul style="list-style-type: none"> • Lab exam • Project
3.0	Values, autonomy, and responsibility			
3.1	Promote ethical, transparent data sharing through accessible interfaces.	V1	<ul style="list-style-type: none"> • Project 	Project
3.2	Encourage collaboration and user-centered design in analytics delivery.	V2	<ul style="list-style-type: none"> • Project 	Project
3.3	Embrace continuous learning of tools and technologies in data communication.	V3	<ul style="list-style-type: none"> • Project • Lab Exercises 	<ul style="list-style-type: none"> • Lab exam • Project

C. Course Content

No	List of Topics	Contact Hours
1.	Overview of Advanced Analytics & Web Applications Lab: Python/R refresher, tool setup (Power BI, Flask, Tableau)	6
2.	Exploratory Data Analysis (EDA) Lab: Hands-on with EDA using pandas, seaborn, plotly	6
3.	Forecasting & Time Series Lab: Time series in Python (statsmodels)	6
4.	Regression and Correlation Models Lab: Linear/logistic regression modeling	6
5.	Clustering & Segmentation	6





	Lab: K-means, hierarchical clustering (Scikit-learn)	
6.	Dashboards with Power BI / Tableau Lab: Building dashboards from ML outputs	6
7.	Introduction to Web App Development Lab: Flask or Dash basics (layouts, callbacks)	6
8.	Building Analytical Web Apps Lab: Deploying ML models in Dash or Flask	6
9.	APIs and Live Data Integration Lab: Connecting to and consuming APIs (e.g., COVID API)	6
10.	Automation & Scheduling Lab: Python scripts for data refresh, CRON/Task Scheduler	6
11.	Case Study: Business Intelligence App Lab: Full workflow from modeling to app deployment	6
12.	Data Ethics & Visualization Best Practices Lab: Bias detection, accessibility in dashboards	6
13.	Final Project Implementation	6
14.	Final Project Presentation	6
15.	Quizzes, exams and revision	6
Total		90

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Week 3 ,12	10%
2.	Midterm Exam	Week 7	20%
3.	Lab Assessment	Week 2-12	15%
4.	Project	Continuous	15%
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	MS Excel, Power BI and Tableau Tutorials
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Supportive References	Python packages (e.g pandas, Flask, Dash) Tutorials
Electronic Materials	Web Development Tutorials
Other Learning Materials	Tutorials and open datasets from APIs, Open data portals, Kaggle.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms
Technology equipment (projector, smart board, software)	Data show projector Collab
Other equipment (depending on the nature of the specialty)	Google Collab using Python version 3

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect Course survey and students' feedback.
Effectiveness of Students	Faculty Members, Peer Reviewers	Direct Report on the satisfaction of exam standards.
Quality of learning resources	Faculty Member, Course Coordinators	Direct Learning resources evaluation survey.
The extent to which CLOs have been achieved	Faculty Members, Program Leaders	Direct Course reports.
Other		

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

Assessment Methods (Direct, Indirect)





G. Specification Approval

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

