

**Curriculum for Associate Degrees to be offered by  
Affiliating Universities in Colleges**  
(18.10.2019)



**Punjab Higher Education Commission (PHEC)**  
**Government of Punjab**  
**Lahore, Pakistan**

## **Curriculum for Associate Degrees to be offered by Affiliating Universities in Colleges**

Recently the HEC, PHEC and HED in keeping with the government's new initiative to focus on quality of education and enhance employability of graduates took the policy decision to abolish the 2-year BA/BSc degrees offered, principally, in affiliated colleges across Pakistan on the annual system pattern. These degrees are to be replaced by the academically more rigorous and relevant 2-year associate degrees, offered on the semester system pattern, by the next academic year.

The associate degree model of offering high quality education with technical expertise at a low cost to produce skillful and employable graduates has been implemented with great success in the developed world. These degrees offered in a wide array of subjects are divided into associate of arts (A.S), associate of science (A.S) and associate of applied (AAS). The associate degree programs prepare students for a specific career or to transfer into a bachelor's degree program offered at university level.

Given the expected change from annual to semester system, in order to facilitate the affiliating universities, curriculum in areas expected to have greater mobility and employability, such as CS, IT etc. have been prepared with the goal of inculcating general education, discipline specific knowledge as well as key market-driven practical skills. The objective of equipping students with both theoretical knowledge and hands-on experience is to help them transition to either further their academic career through transfer to the BS4YP or by entering the job market. List of (10) programs for which the curriculum is enclosed is as under:

1. Associate Degree (AD) Program in Computer Science
2. Associate Degree (AD) Program in Computer Networking & Infrastructure
3. Associate Degree (AD) Program in Database Management System
4. Associate Degree (AD) Program in Web Design and Development
5. Associate Degree (AD) Program in Cyber Security
6. Associate Degree (AD) Program in Robotics and Artificial Intelligence
7. Associate Degree (AD) Program in Hotel and Restaurant Management
8. Associate Degree (AD) Program in Economics
9. Associate Degree (AD) Program in Business Administration
10. Associate Degree (AD) Program in English Language and Linguistics

Universities are encouraged to use these as a template to prepare curriculum for the various 2-year arts and sciences associate degree programs to be offered in colleges in the upcoming academic year while also ensuring vertical mobility of high performing students through transfer to the 5<sup>th</sup> semester of the BS 4 year programs. It is also suggested that the award of 2-year associate degree be contingent upon completing a mandatory 3-month internship for which a Pass/Fail grade may be allocated following a presentation given by the student and submission of a report.

## Curriculum for Associate Degree (AD) Program in Computer Science

SN	Course Title	Credit Hours
<b>1st ADP semester</b>		
1.	Introduction to Computing	03
2.	Calculus and Analytical Geometry	03
3.	Financial Accounting	03
4.	English Comprehension	02
5.	Pakistan Studies and Global Perspectives	02
6.	Islamic Studies & Professional Ethics <b>OR</b> General and Professional Ethics (for Non-Muslims)	02
<b>Semester Total</b>		<b>15</b>
<b>2nd ADP semester</b>		
7.	Introduction to Programming	03
8.	Digital Logic Design	03
9.	Calculus II	03
10.	Discrete Mathematics & Linear Algebra	03
11.	Economics	03
12.	Business and Technical English Writing	02
<b>Semester Total</b>		<b>17</b>
<b>3rd ADP semester</b>		
13.	Data Structures	03
14.	Object Oriented Programming	03
15.	Data Communication	03
16.	Differential Equations	03
17.	Circuit Theory	03
18.	Statistics and Probability	03
<b>Semester Total</b>		<b>18</b>
<b>4th ADP semester</b>		
19.	Computer Architecture and Assembly Language Programming	03
20.	Database Management Systems	03
21.	Software Engineering	03
22.	Computer Networks	03
23.	Numerical Analysis	03
24.	Physics	03
25.	Internship ( <i>Mandatory - 03 Months</i> )	Pass/Fail
<b>Semester Total</b>		<b>18</b>
<b>Grand Total</b>		<b>68</b>

## Curriculum for Associate Degree (AD) Program in Computer Networking & Infrastructure

SN	Course Title	Credit Hours
<b>1st ADP semester</b>		
1.	ICT & Introduction to programming (using C language) with Lab	04
2.	Calculus and Analytical Geometry	03
3.	Digital Logic Design (DLD) with Lab	04
4.	English Comprehension	03
5.	Pakistan Studies and Global Perspectives	02
<b>Semester Total</b>		<b>16</b>
<b>2nd ADP semester</b>		
6.	Data Structures & Algorithms (using C language) with Lab	04
7.	Computer Architecture & Organization	03
8.	Probability & Statistics	03
9.	Communication Skills	03
10.	Data Analysis & Machine Learning (using Python)	03
11.	Islamic Studies & Professional Ethics OR General and Professional Ethics (for Non-Muslims)	02
<b>Semester Total</b>		<b>18</b>
<b>3rd ADP semester</b>		
12.	Cloud Infrastructure	04
13.	Operating Systems / Database Systems with Lab	04
14.	Containerization & Orchestration	04
15.	Development Operations	03
16.	Computer Networks - I	03
<b>Semester Total</b>		<b>18</b>
<b>4th ADP semester</b>		
17.	Computer Networks – II with Lab	03
18.	Distributed Systems / Internet of Things	03
19.	Information Security / Network Security	04
20.	Software Engineering	03
21.	Technical Report Writing	03
22.	Internship ( <i>Mandatory - 03 Months</i> )	Pass/Fail
<b>Semester Total</b>		<b>16</b>
<b>Grand Total</b>		<b>68</b>

## Curriculum for Associate Degree (AD) Program in Database Management System

SN	Course Title	Credit Hours
<b>1st ADP semester</b>		
1.	Introduction to Computing	03
2.	Introduction to Programming	03
3.	Financial Accounting	03
4.	Business Mathematics & Statistics	03
5.	English Comprehension	02
6.	Pakistan Studies and Global Perspectives	02
7.	Islamic Studies & Professional Ethics <b>OR</b> General and Professional Ethics (for Non-Muslims)	02
<b>Semester Total</b>		<b>18</b>
<b>2nd ADP semester</b>		
8.	Data Structures	03
9.	Database Modeling and Design	03
10.	Database Management Systems	03
11.	Web Design and Development	03
12.	Information Systems	03
13.	Business and Technical English Writing	02
<b>Semester Total</b>		<b>17</b>
<b>3rd ADP semester</b>		
14.	Database Programming using Oracle 11g / NoSQL (MongoDB)	03
15.	Web Based Database Applications	03
16.	Introduction to Database Administration	03
17.	Visual Programming	03
18.	Software Engineering – I / AGILE / SCRUM / Kanban Method	03
19.	Operating Systems	03
<b>Semester Total</b>		<b>18</b>
<b>4th ADP semester</b>		
20.	Information Security	03
21.	Big Data Concepts / Data Science	03
22.	Numerical Analysis	03
23.	E-Commerce	03
24.	Semester Project	03
25.	Internship ( <i>Mandatory - 03 Months</i> )	Pass/Fail
<b>Semester Total</b>		<b>15</b>
<b>Grand Total</b>		<b>68</b>

## Curriculum for Associate Degree (AD) Program in Web Design and Development

SN	Course Title	Credit Hours
<b>1st ADP semester</b>		
1.	Introduction to Computing	03
2.	Introduction to Programming	03
3.	Fundamentals of Front-end Development	03
4.	Discrete Mathematics	03
5.	English Comprehension	02
6.	Pakistan Studies and Global Perspectives	02
7.	Islamic Studies & Professional Ethics <b>OR</b> General and Professional Ethics (for Non-Muslims)	02
<b>Semester Total</b>		<b>18</b>
<b>2nd ADP semester</b>		
8.	Data Structures	03
9.	Object Oriented Programming	03
10.	Database Management	03
11.	Web Design and Development	03
12.	Data Communication	03
13.	Business and Technical English Writing	02
<b>Semester Total</b>		<b>17</b>
<b>3rd ADP semester</b>		
14.	Open Source Web Application Development (PHP, PERL, CGI, MySQL)	03
15.	Software Engineering-I	03
16.	Information Systems	03
17.	Operating Systems / Single Page Application	03
18.	E-Commerce / AGILE / SCRUM / KANBAN Method	03
19.	Introduction to Web Services Development	03
<b>Semester Total</b>		<b>18</b>
<b>4th ADP semester</b>		
20.	Human Computer Interaction / UI & UX designs	03
21.	Numerical Analysis	03
22.	Web Development for Portable Devices	03
23.	Cyber Law	03
24.	Semester Project	03
25.	Internship ( <i>Mandatory - 03 Months</i> )	Pass/Fail
<b>Semester Total</b>		<b>15</b>
<b>Grand Total</b>		<b>68</b>

## Curriculum for Associate Degree (AD) Program in Cyber Security

SN	Course Title	Credit Hours
<b>1st ADP semester</b>		
1.	ICT & Introduction to programming (using C language) with Lab	04
2.	Calculus and Analytical Geometry	03
3.	Digital Logic Design (DLD) with Lab	04
4.	English Comprehension	03
5.	Pakistan Studies and Global Perspectives	02
<b>Semester Total</b>		<b>16</b>
<b>2nd ADP semester</b>		
6.	Data Structures & Algorithms (using C language) with Lab	04
7.	Computer Architecture & Organization	03
8.	Probability & Statistics	03
9.	OWASP / Penetration Testing	03
10.	Communication Skills	03
11.	Islamic Studies & Professional Ethics OR General and Professional Ethics (for Non-Muslims)	02
<b>Semester Total</b>		<b>18</b>
<b>3rd ADP semester</b>		
12.	Ethical Hacking	04
13.	Operating Systems with Lab	04
14.	Database Systems with Lab	04
15.	Computer Networks - I	03
16.	Methodology standards & Protocol (27001)	03
<b>Semester Total</b>		<b>18</b>
<b>4th ADP semester</b>		
17.	Computer Networks – II with Lab	03
18.	Distributed Systems / Internet of Things	03
19.	Information Security / Network Security	04
20.	Software Engineering	03
21.	Technical Report Writing	03
22.	Internship ( <i>Mandatory - 03 Months</i> )	Pass/Fail
<b>Semester Total</b>		<b>16</b>
<b>Grand Total</b>		<b>68</b>

**Curriculum for Associate Degree (AD) Program in  
Robotics and Artificial Intelligence (A.I)**

SN	Course Title	Credit Hours
<b>1st ADP semester</b>		
1.	Introduction to computing	03
2.	Calculus and Analytical Geometry	03
3.	Financial Accounting	03
4.	English Comprehension	02
5.	Pakistan Studies and Global Perspectives	02
6.	Islamic Studies & Professional Ethics <b>OR</b> General and Professional Ethics (for Non-Muslims)	02
<b>Semester Total</b>		<b>15</b>
<b>2nd ADP semester</b>		
7.	Programming for Machine Learning	03
8.	Business and Technical English Writing	02
9.	Linear Algebra & Discrete Mathematics	03
10.	Calculus II	03
11.	Economics	03
12.	Computer vision in Control Systems	03
<b>Semester Total</b>		<b>17</b>
<b>3rd ADP semester</b>		
13.	Data Structures	03
14.	Object Oriented Programming <b>OR</b> Python	03
15.	Data Communication	03
16.	Engineering Graphics	03
17.	Additive Design and Manufacturing (3D Printing)	03
18.	Statistics and Probability	03
<b>Semester Total</b>		<b>18</b>
<b>4th ADP semester</b>		
19.	Computer Architecture and Assembly Language Programming	03
20.	Database Management Systems	03
21.	Robotics and Artificial Intelligence (AI)	03
22.	System Analysis and Design	03
23.	Numerical Analysis	03
24.	Data Systems and Analysis	03
25.	Internship ( <i>Mandatory - 03 Months</i> )	Pass/Fail
<b>Semester Total</b>		<b>18</b>
<b>Grand Total</b>		<b>68</b>



**Curriculum for Associate Degree (AD) Program in  
Hotel & Restaurant Management**

SN	Course Title	Credit Hours
<b>1st ADP semester</b>		
1.	Hotel Management I	03
2.	Restaurant Management I	03
3.	Kitchen Management I	03
4.	Introduction to Food & beverage Operations	03
5.	English Comprehension	03
6.	Islamic Studies & Professional Ethics <b>OR</b> General and Professional Ethics (for Non-Muslims)	02
<b>Semester Total</b>		<b>18</b>
<b>2nd ADP semester</b>		
7.	Hotel Management II	03
8.	Restaurant Management II	03
9.	Kitchen Management II	03
10.	Room Division I	03
11.	Mathematics	03
12.	Pakistan Studies & Global Perspectives	02
<b>Semester Total</b>		<b>17</b>
<b>3rd ADP semester</b>		
12.	Hotel Management III	03
13.	Room Division II	03
14.	Event Management and Marketing	03
15.	Business Management in Hospitality	03
16.	Introduction to Computing	03
17.	Fundamentals of Accounting	03
<b>Semester Total</b>		<b>18</b>
<b>4th ADP semester</b>		
17.	Tour Operations	03
18.	Management Information Systems	03
19.	Consumer Behaviour	03
20.	International Hotels: Development and Management	02
21.	Semester Project	03
22.	Internship ( <i>Mandatory - 03 Months</i> )	Pass/Fail
<b>Semester Total</b>		<b>14</b>
<b>Grand Total</b>		<b>67</b>

## Curriculum for Associate Degree (AD) Program in Economics

SN	Course Title	Credit Hours
<b>1st ADP semester</b>		
1.	Intro to Information Technology	03
2.	Microeconomics	03
3.	History of Economic Thoughts	03
4.	English Comprehension	02
5.	Communication Skills	03
6.	Pakistan Studies and Global Perspectives	02
<b>Semester Total</b>		<b>16</b>
<b>2nd ADP semester</b>		
7.	Mathematics (Algebra)	03
8.	Sociology	03
9.	Statistics	03
10.	Islamic Economics	03
11.	Interpersonal Skills	03
12.	Islamic Studies & Professional Ethics OR General and Professional Ethics (for Non-Muslims)	02
<b>Semester Total</b>		<b>17</b>
<b>3rd ADP semester</b>		
13.	Macroeconomics	03
14.	Mathematical Economics -I	03
15.	Public Finance	03
16.	Statistical Inference	03
17.	Business Communication	03
<b>Semester Total</b>		<b>15</b>
<b>4th ADP semester</b>		
18.	Intermediate Microeconomics	03
19.	Business & Labour Law	03
20.	Business Finance	03
21.	Logic & Critical Thinking	03
22.	Business Report Writing	03
23.	Semester Project	03
24.	Internship ( <i>Mandatory - 03 Months</i> )	Pass/Fail
<b>Semester Total</b>		<b>18</b>
<b>Grand Total</b>		<b>66</b>

**Curriculum for Associate Degree (AD) Program in  
Business Administration**

SN	Course Title	Credit Hours
<b>1st ADP semester</b>		
1.	Introduction to Computing	03
2.	Financial Accounting	03
3.	Business Mathematics & Statistics	03
4.	English Comprehension	02
5.	Pakistan Studies and Global Perspectives	02
6.	Islamic Studies & Professional Ethics OR General and Professional Ethics (for Non-Muslims)	02
<b>Semester Total</b>		<b>15</b>
<b>2nd ADP semester</b>		
7.	Introduction to Business	03
8.	Principles of Marketing	03
9.	Principles of Management	03
10.	Introduction to Sociology	03
11.	Statistics and Probability	03
12.	Business and Technical English Writing	02
<b>Semester Total</b>		<b>17</b>
<b>3rd ADP semester</b>		
13.	Microeconomics	03
14.	Introduction to Public Administration	03
15.	Financial Accounting II	03
16.	Strategic Management	03
17.	Communication Skills	03
<b>Semester Total</b>		<b>15</b>
<b>4th ADP semester</b>		
18.	Business Finance	03
19.	Macroeconomics	03
20.	E-Commerce	03
21.	Human Resource Management	03
22.	Organizational Behaviour	03
23.	Semester Project	03
24.	Internship ( <i>Mandatory - 03 Months</i> )	Pass/Fail
<b>Semester Total</b>		<b>18</b>
<b>Grand Total</b>		<b>65</b>

**Proposed Curriculum for Associate Degree (AD) Program in  
English Language & Linguistics**

SN	Course Title	Credit Hours
<b>1st ADP semester</b>		
1.	Introduction to English Linguistics	03
2.	Introduction to Phonetics & Phonology	03
3.	Foundation of Syntax	03
4.	Basic Oral/Speaking Skills	02
5.	Reading Comprehension	03
6.	Convention in Writing/Composition Writing	02
7.	Islamic Studies & Professional Ethics <b>or</b> General and Professional Ethics (for Non-Muslims)	02
<b>Semester Total</b>		<b>18</b>
<b>2<sup>nd</sup> ADP semester</b>		
8.	Advance Syntax & Grammar	03
9.	Business Communication	03
10.	Advance Oral/Speaking Skills	03
11.	Advance Reading Comprehension	03
12.	Creative Writing	03
13.	Pakistan Studies and Global Perspectives	02
<b>Semester Total</b>		<b>17</b>
<b>3<sup>rd</sup> ADP semester</b>		
14.	Introduction to Morphology	03
15.	Semantics	03
16.	Presentation Skills	03
17.	Argumentative Writings and Critical Thinking	03
18.	Report Writing & Technical English	03
19.	Introduction to Mathematics/Statistics	03
<b>Semester Total</b>		<b>18</b>
<b>4<sup>th</sup> ADP semester</b>		
20.	Stylistics	03
21.	Academic Writing	03
22.	Community Service Learning & Community Project	03
23.	Basics of Computing	03
24.	Final Year Project	03
<b>Semester Total</b>		<b>15</b>
<b>Grand Total</b>		<b>68</b>