Table 3.2: Offered Courses in DCSE.

Semester No	Sr No	Course Code	Course Title	Credit Hours	Knowledge Area	Pre-requisite courses
1	1	BSI-101	Islamic-Studies	(2-0-2)	Humanities	Nil
	2	BSI-122	Calculus	(3-0-3)	Natural Sciences	Nil
	3	BSI-131	English Composition & Comprehension	(2-0-2)	Humanities	Nil
	4	CSE-101	Information and Communication Technology (ICT)	(3-1-4)	Computer Science	Nil
	5	BSI-181	Applied Physics	(3-1-4)	Natural Sciences	Nil
	6	ME-106	Engineering Workshop	(0-1-1)	Multi-Disciplinary Engineering courses	Nil
	7	BSI-119	Pakistan Studies	(2-0-2)	Humanities	Nil
Total Credit Hours				**14-3-17**		
2	1	BSI-110	Pakistan-Studies	(2-0-2)	Humanities	Nil
	2	BSI-231	Differential Equations	(3-0-3)	Natural Sciences	Nil
	3	CSE-102	Computer Programming	(3-1-4)	Computer Science	Nil
	4	CSE-201	Circuit Analysis	(3-1-4)	Engineering Foundation	Nil
	5	BSI-111	Linear Algebra	(3-0-3)	Natural Sciences	Nil
	6	CSE-211	Occupational health & Safety	(1-0-1)	Natural Sciences	Nil
	7	CSE-212	Civics and Community Engagement	(2-0-2)	Natural Sciences	Nil
Total Credit Hours				**15-2-17**		
3	1	CSE-209	Probability Methods in Engineering	(3-0-3)	Natural Sciences	Nil

	2	BSI-362	Complex Variables	(3-0-3)	Natural Sciences	Nil
	3	CSE-202	Digital Logic Design	(3-1-4)	Engineering Foundation	Nil
	4	CSE-206	Electronics Circuits	(3-1-4)	Engineering Foundation	Nil
	5	CSE-208	Object Oriented Programming	(3-1-4)	Engineering Foundation	Nil
Total Credit Hours				**15-3-18**		
4	1	CSE-204	Operating Systems	(3-1-4)	Engineering Foundation	Nil
	2	CSE-301	Signals & Systems	(3-1-4)	Engineering Foundation	Nil
	3	CSE-303	Computer Communication & Network	(3-1-4)	Major Based Core (Breadth)	Nil
	4	BSI-141	Communications & Presentation Skills	(2-0-2)	Humanities	Nil
	5	CSE-210	Data Structures & Algorithms	(3-1-4)	Engineering Foundation	Nil
Total Credit Hours				**14-4-18**		
5	1	CSE-404	Software Engineering	(3-0-3)	Major Based Core (Breadth)	Nil
	2	CSE-302	Systems Programming (CEDE-I)	(3-1-4)	Computer Engineering Depth Elective	Nil
	3	CSE-402	Digital Signal Processing	(3-1-4)	Major Based Core (Breadth)	Nil

	4	CSE-304	Computer Organization & Architecture	(3-1-4)	Major Based Core (Depth)	Nil
	5	CSE-305	Engineering Economics	(2-0-2)	Social Sciences	Nil
	Total Credit Hours			**14-3-17**		
6	1	BSI-120	Professional Ethics	(2-0-2)	Social Science	Nil
	2	CSE-307	Microprocessor Based System Design	(3-1-4)	Major Based Core (Breadth)	Nil
	3	CSE-308	Digital System Design	(3-1-4)	Major Based Core (Breadth)	Nil
	4	CSE-403	Database Management System	(3-1-4)	Major Based Core (Depth)	Nil
	5	CSE-311	Technical Writing	(3-0-3)	Humanities	Nil
	Total Credit Hours			**15-3-18**		
7	1	CSE-401a	Final year project – I	(0-3-3)	Senior Design Project	Nil
	2	CSE-422	Data Analytics (MDEE-I)	(3-0-3)	Multi-Disciplinary Depth Engineering Electives	Nil
	3	CSE-310	Control Engineering (CEDE-II)	(3-1-4)	Computer Engineering Depth Elective	Nil
	3	CSE-411	Intro. To Game Development (CEDE-III)	(3-0-3)	Computer Engineering Depth Elective	Nil

	3	CSE-420	Embedded System Design (CEDE-IV)	(3-0-3)	Computer Engineering Depth Elective	Nil
	Total Credit Hours			**12-4-16**		
8	1	CSE-401b	Final year project – II	(0-3-3)	Senior Design Project	Nil
	2	CSE-406	Engineering Project Management	(3-0-3)	Social Science	Nil
	3	CSE-408	Digital Image Processing (MDEE-II)	(3-0-3)	Multi-Disciplinary Depth Engineering Electives	Nil
	4	CSE-407	Artificial Intelligence (CEDE-V)	(3-1-4)	Computer Engineering Depth Elective	Nil
	5	CSE-4XX	MDEE-III	(3-0-3)	Multi-Disciplinary Depth Engineering Electives	Nil
	Total Credit Hours			**11-4-15**		

3.1.2 Elective Courses

The list of elective courses offered is given as follows:

Computer Engineering Depth Courses (CEDE)

- Cloud and Distributed Computing
- Internet of Things
- Embedded System Design
- Artificial Intelligence and Machine Learning
- Image Processing and Analysis
- Cyber Security
- Systems Programming
- High-Performance Computing
- Control Engineering

- Algorithm Design and Analysis
- Hardware Design for DSP and ML
- Advance Computer Architecture
- Advance Electronics
- Modern Programming Languages
- Multimedia Communication
- Digital Communication
- Network Modelling and simulation
- Network Programming
- Optical Networks
- IP Network

Multi-Disciplinary Engineering Electives (MDEE)

- Human-Computer Interaction (UI/UX)
- Block Chain Technologies and Applications
- Neural Network and Fuzzy Logic
- Robotics and automation
- Mobile Application/ Game Development
- Virtual Reality
- Software Quality Assurance
- VLSI System Design
- Data Warehousing and Big data
- GIS and Remote Sensing
- Health, Safety and Environment (HSE)
- Business Process Re-engineering
- Web Engineering
- Computer Graphics
- Fault Tolerant Computing
- Discrete Structures
- Numerical Analysis
- Data Analytics
- Bioinformatics

Management Sciences (MS) Electives

- Engineering Project Management
- Entrepreneurship

Social Sciences (MS) Electives

- Professional Ethics
- Sociology for Engineers
- Engineering Economics