Curriculum of Outcome Based Education

For

Bachelor of Science in Computer Science and Engineering

Department of Computer Science and Engineering

Faculty of Electrical and Electronic Engineering

Dhaka University of Engineering & Technology, Gazipur

2021

PART-B

Cumulative Complete Credit

Name of Semester	Credit	Cumulative Total Credit
1st year 1st semester (exempted)	**17.25**	**-**
1st year 2nd semester	**21.50**	**21.50**
2nd year 1st semester	**21.25**	**42.75**
2nd year 2nd semester	**20.50**	**63.25**
3rd year 1st semester	**21.00**	**84.25**
3rd year 2nd semester	**19.50**	**103.75**
4th year 1st semester	**21.00**	**124.75**
4th year 2nd semester	**20.25**	**145**
Total credit with exempted	**162.25**	**Cumulative Total Credit(145)**

16. Curriculum Structure

Summary of Course Plan

Year Semester	Theory		Sessional		Total Credits
	No. of Courses	Credits	No. of Courses	Credits	
1st Year 1st Semester*	05	15.00	03	2.25	17.25
1st Year 2nd Semester	05	17.00	04	4.50	21.50
2nd Year 1st Semester	05	16.00	05	5.25	21.25
2nd Year 2nd Semester	05	16.00	05	4.50	20.50
3rd Year 1st Semester	05	15.00	05	6.00	21.00
3rd Year 2nd Semester	05	15.00	05	4.50	19.50
4th Year 1st Semester	05	15.00	05	6.00	21.00
4th Year 2nd Semester	05	15.00	05	5.25	20.25
Total	**40**	**124.00**	**38**	**38.25**	**162.25**
Total (Without exempted)	**35**	**109.00**	**35**	**36.00**	**145.00**

**1st year 1st semester is exempted for the students who have completed for year diploma degree from a relevant diploma engineering branch.*

Relevant diploma engineering branches are:

- ❖ *Computer Science & Technology*
- ❖ *Computer Technology*
- ❖ *Electronics Technology*
- ❖ *Data Telecommunication and Networking Technology*
- ❖ *Graphics Technology*
- ❖ *Printing Technology*

Category-wise Percentage of Course Credits

Type	Percentage of Credits (BAETE/UGC Guideline)	Percentage of Credits (CSE, DUET) Total: 162.25
Language and General Education	12 – 15	(19.50) 12.02
Basic Science	8 – 10	(14.25) 8.78

Mathematics	8 – 10	(13.50) 8.32
Other Engineering (EEE, ED)	8 – 10	(13.50) 8.32
Core Subjects	40 – 50	(81.25) 50.08
Elective Subjects	12 – 15	(20.25) 12.48
Total	100	(162.25) 100.00

EEE – Electrical and Electronic Engineering, ED – Engineering Drawing

Course Distribution

I. Language and General Education [19.50 Credits]

a. Language

Category	Course	Credits
Language	HSS 1427: English	3.00
	HSS 2418: English Sessional	0.75
	HSS 3427: Professional English	3.00
Total		**6.75**

b. General Education

Category	Course	Credits
Social Science	HSS 1417: Government and Sociology	3.00
	HSS 4417: Financial and Managerial Accounting	3.00
Arts and Humanities	HSS 3417: Bangladesh Studies	3.00
	CSE 4004: Ethics in Computer Science and Engineering	0.75
Business	HSS 4427: Economics and Entrepreneurship for IT	3.00
Total		**12.75**

II. Basic Sciences and Mathematics [27.75 Credits]

a. Basic Sciences [14.25 Credits]

Category	Course	Credits
Physics	Phy 1423: Heat, Properties of Matter, Electricity and Magnetism	3.00
	Phy 1424: Heat, Properties of Matter, Electricity and Magnetism Sessional	0.75
	Phy 2413: Optics, Structure of Solid and Modern Physics	3.00
	Phy 2414: Optics, Structure of Solid and Modern Physics Sessional	0.75
Chemistry	Ch 1415: Introductory Chemistry	3.00
	Ch 2415: Inorganic and Physical Chemistry	3.00
	Ch 2416: Inorganic and Physical Chemistry Sessional	0.75
Total		**14.25**

b. Mathematics [13.50 Credits]

Category	Course	Credits
	Math 1421: Differential and Integral Calculus	4.00

Mathematics	Math 2411: Coordinate Geometry, Ordinary Differential Equations and Laplace Transformations	4.00
	Math 2421: Matrix, Vector Analysis and Statistics	4.00
	CSE 2124: Mathematical Analysis for Computer Science Sessional	1.50
Total		**13.50**

III. Other Engineering [13.50 Credits]

Category	Course	Credits
Electrical & Electronic Engineering	EEE 1811: Introduction to Electrical Engineering	3.00
	EEE 1812: Introduction to Electrical Engineering Sessional	0.75
	EEE 2813: Electronic Circuits and Pulse Techniques	3.00
	EEE 2814: Electronic Circuits and Pulse Techniques Sessional	1.50
	EEE 2823: Electrical Drives and Instrumentation	3.00
	EEE 2824: Electrical Drives and Instrumentation Sessional	0.75
Engineering Drawing	CSE 1124: Drawing and CAD Project Sessional	1.50
Total		**13.50**

IV. Core Courses [81.25 Credits]

Category	Course	Credits
Programming (13.75 Credits)	CSE 1111: Basic Programming	3.00
	CSE 1112: Basic Programming Sessional	0.75
	CSE 1121: Structured and Object Oriented Programming Language	4.00
	CSE 1122: Structured and Object Oriented Programming Language Sessional	1.50
	CSE 2110: Advanced Programming Sessional	1.50
	CSE 3114: Web Programming Sessional	1.50
	CSE 3120: Mobile Application Development Project	1.50
Hardware Systems (15.00 Credits)	CSE 1811: Computer Fundamental	3.00
	CSE 1812: Computer Fundamental Sessional	0.75
	CSE 1823: Digital Logic and System Design	3.00
	CSE 1824: Digital Logic and System Design Sessional	0.75
	CSE 2823: Computer Architecture	3.00
	CSE 3811: Microprocessor and Interfacing	3.00
	CSE 3812: Microprocessor and Interfacing Sessional	1.50
Logics and Algorithms (11.25 Credits)	CSE 2513: Discrete Mathematics	3.00
	CSE 2521: Data Structure	3.00
	CSE 2522: Data Structure Sessional	0.75
	CSE 3511: Algorithm Design and Analysis	3.00

	CSE 3512: Algorithm Design and Analysis Sessional	1.50
Systems (21.75 Credits)	CSE 2321: Database Systems	3.00
	CSE 2322: Database Systems Sessional	0.75
	CSE 3211: Theory of Computation	3.00
	CSE 3411: Data Communication	3.00
	CSE 3412: Data Communication Sessional	0.75
	CSE 3221: Operating System	3.00
	CSE 3222: Operating System Sessional	0.75
	CSE 3421: Computer Networks	3.00
	CSE 3422: Computer Networks Sessional	0.75
	CSE 4211: Compiler Design	3.00
	CSE 4212: Compiler Design Sessional	0.75
Software Systems and Engineering (7.50 Credits)	CSE 3721: Information System Analysis and Design	3.00
	CSE 3722: Information System Analysis and Design Sessional	0.75
	CSE 4721: Software Engineering	3.00
	CSE 4722: Software Engineering Sessional	0.75
Others (7.50 Credits)	CSE 2122: Software and Hardware Project	0.75
	CSE 3110: Technical Writing and Presentation	0.75
	CSE 3621: Artificial Intelligence	3.00
	CSE 3622: Artificial Intelligence Sessional	0.75
	CSE 4002: Industrial Training	0.75
Project and Thesis	CSE 4000: Project and Thesis	6.00
Total		**81.25**

V. Technical Electives [20.25 Credits]

Category	Course	Credits
Technical Electives (20.25 Credits)	CSE 4311: Geographical Information System	3.00
	CSE 4312: Geographical Information System Sessional	0.75
	CSE 4511: Computer Graphics	3.00
	CSE 4512: Computer Graphics Sessional	0.75
	CSE 4513: Computational Geometry	3.00
	CSE 4514: Computational Geometry Sessional	0.75
	CSE 4611: Machine Learning	3.00
	CSE 4612: Machine Learning Sessional	0.75
	CSE 4713: Simulation and Modeling	3.00
	CSE 4714: Simulation and Modeling Sessional	0.75
	CSE 4411: E-commerce and Internet Security	3.00
	CSE 4413: Communication Engineering	3.00
	CSE 4515: Graph Theory	3.00

	CSE 4613: Human Computer Interaction	3.00
	CSE 4811: Digital Signal Processing	3.00
	CSE 4621: Neural Networks and Pattern Recognition	3.00
	CSE 4622: Neural Networks and Pattern Recognition Sessional	0.75
	CSE 4623: Bioinformatics	3.00
	CSE 4624: Bioinformatics Sessional	0.75
	CSE 4821: VLSI Design	3.00
	CSE 4822: VLSI Design Sessional	0.75
	CSE 4823: Digital Image Processing	3.00
	CSE 4824: Digital Image Processing Sessional	0.75
	CSE 4321: Big Data Analytics	3.00
	CSE 4421: Cyber Physical System	3.00
	CSE 4521: Parallel and Distributed Processing	3.00
	CSE 4523: Algorithm Engineering	3.00
	CSE 4625: Robotics and IOT	3.00
	CSE 4723: Information System Management	3.00
	CSE 4725: Knowledge Engineering	3.00
	CSE 4727: Decision Support System	3.00
	CSE 4825: Fault Tolerant System	3.00
	CSE 4827: Advanced Computer Architecture	3.00
	CSE 4829: High Performance Computing	3.00

17. Year and Semester-wise Distribution of the Courses

Undergraduate students of the Department of Computer Science and Engineering have to follow a particular course schedule which is given in the following pages according to year and semester-wise distribution of the courses.

a. 1st Year 1st Semester (Exempted)

Sl. No.	Course No.	Course Title	Hours/Week		Credits
			Theory	Sessional	
1.	CSE 1111	Basic Programming	3.00	-	3.00
2.	CSE 1112	Basic Programming Sessional	-	1.50	0.75
3.	CSE 1811	Computer Fundamental	3.00	-	3.00
4.	CSE 1812	Computer Fundamental Sessional	-	1.50	0.75

5.	EEE 1811	Introduction to Electrical Engineering	3.00	-	3.00
6.	EEE 1812	Introduction to Electrical Engineering Sessional	-	1.50	0.75
7.	Ch 1415	Introductory Chemistry	3.00	-	3.00
8.	HSS 1417	Government and Sociology	3.00	-	3.00
Total			**15.00**	**4.50**	**17.25**

Contact Hours: 15T + 4.5S = 19.5 Hours / Week No. of Theory Courses: 5

Total Credits: 17.25 No. of Lab / Sessional Courses: 3

b. 1st Year 2nd Semester

Sl. No.	Course No.	Course Title	Hours/Week		Credits
			Theory	Sessional	
1.	CSE 1121	Structured and Object Oriented Programming Language	4.00	-	4.00
2.	CSE 1122	Structured and Object Oriented Programming Language Sessional	-	3.00	1.50
3.	CSE 1124	Drawing and CAD Project Sessional	-	3.00	1.50
4.	CSE 1823	Digital Logic and System Design	3.00	-	3.00
5.	CSE 1824	Digital Logic and System Design Sessional	-	1.50	0.75
6.	Math 1421	Differential and Integral Calculus	4.00	-	4.00
7.	Phy 1423	Heat, Properties of Matter, Electricity and Magnetism	3.00	-	3.00
8.	Phy 1424	Heat, Properties of Matter, Electricity and Magnetism Sessional	-	1.50	0.75
9.	HSS 1427	English	3.00	-	3.00
Total			**17.00**	**9.00**	**21.50**

Contact Hours: 17T + 9S = 26 Hours / Week

No. of Theory Courses: 5

Total Credits: 21.50

No. of Lab / Sessional Courses: 4

c. 2nd Year 1st Semester

Sl. No.	Course No.	Course Title	Hours/Week		Credits
			Theory	Sessional	
1.	CSE 2110	Advanced Programming Sessional	-	3.00	1.50
2.	CSE 2513	Discrete Mathematics	3.00	-	3.00
3.	EEE 2813	Electronic Circuits and Pulse Techniques	3.00	-	3.00
4.	EEE 2814	Electronic Circuits and Pulse Techniques Sessional	-	3.00	1.50

5.	Math 2411	Coordinate Geometry, Ordinary Differential Equations and Laplace Transformations	4.00	-	4.00
6.	Phy 2413	Optics, Structure of Solid and Modern Physics	3.00	-	3.00
7.	Phy 2414	Optics, Structure of Solid and Modern Physics Sessional	-	1.50	0.75
8.	Ch 2415	Inorganic and Physical Chemistry	3.00	-	3.00
9.	Ch 2416	Inorganic and Physical Chemistry Sessional	-	1.50	0.75
10.	HSS 2418	English Sessional	-	1.50	0.75
Total			**16.00**	**10.50**	**21.25**

Contact Hours: 16T + 10.50S = 26.50 Hours / Week No. of Theory Courses: 5

Total Credits: 21.25 No. of Lab / Sessional Courses: 5

d. 2nd Year 2nd Semester

Sl. No.	Course No.	Course Title	Hours/Week		Credits
			Theory	Sessional	
1.	CSE 2122	Software and Hardware Project	-	1.50	0.75
2.	CSE 2124	Mathematical Analysis for Computer Science Sessional	-	3.00	1.50
3.	CSE 2321	Database Systems	3.00	-	3.00
4.	CSE 2322	Database Systems Sessional	-	1.50	0.75
5.	CSE 2521	Data Structure	3.00	-	3.00
6.	CSE 2522	Data Structure Sessional	-	1.50	0.75
7.	CSE 2823	Computer Architecture	3.00	-	3.00
8.	EEE 2823	Electrical Drives and Instrumentation	3.00	-	3.00
9.	EEE 2824	Electrical Drives and Instrumentation Sessional	-	1.50	0.75
10.	Math 2421	Matrix, Vector Analysis and Statistics	4.00	-	4.00
Total			**16.00**	**9.00**	**20.50**

Contact Hours: 16T + 9S = 25 Hours / Week | No. of Theory Courses: 5

Total Credits: 20.50 | No. of Lab / Sessional Courses: 5

e. 3rd Year 1st Semester

Sl. No.	Course No.	Course Title	Hours/Week		Credits
			Theory	Sessional	
1.	CSE 3110	Technical Writing and Presentation	-	1.50	0.75
2.	CSE 3114	Web Programming Sessional	-	3.00	1.50
3.	CSE 3211	Theory of Computation	3.00	-	3.00
4.	CSE 3411	Data Communication	3.00	-	3.00
5.	CSE 3412	Data Communication Sessional	-	1.50	0.75
6.	CSE 3511	Algorithm Design and Analysis	3.00	-	3.00
7.	CSE 3512	Algorithm Design and Analysis Sessional	-	3.00	1.50
8.	CSE 3811	Microprocessor and Interfacing	3.00	-	3.00
9.	CSE 3812	Microprocessor and Interfacing Sessional	-	3.00	1.50
10.	HSS 3417	Bangladesh Studies	3.00	-	3.00
Total			**15.00**	**12.00**	**21.00**

Contact Hours: 15T + 12S = 27 Hours / Week | No. of Theory Courses: 5

Total Credits: 21.00 | No. of Lab / Sessional Courses: 5

f. 3rd Year 2nd Semester

Sl. No.	Course No.	Course Title	Hours/Week		Credits
			Theory	Sessional	
1.	CSE 3120	Mobile Application Development Project	-	3.00	1.50
2.	CSE 3221	Operating System	3.00	-	3.00
3.	CSE 3222	Operating System Sessional	-	1.50	0.75
4.	CSE 3421	Computer Networks	3.00	-	3.00
5.	CSE 3422	Computer Networks Sessional	-	1.50	0.75
6.	CSE 3621	Artificial Intelligence	3.00	-	3.00
7.	CSE 3622	Artificial Intelligence Sessional	-	1.50	0.75
8.	CSE 3721	Information System Analysis and Design	3.00	-	3.00
9.	CSE 3722	Information System Analysis and Design Sessional	-	1.50	0.75
10.	HSS 3427	Professional English	3.00	-	3.00
Total			**15.00**	**9.00**	**19.50**

Contact Hours: 15T + 9S = 24 Hours / Week
No. of Theory Courses: 5
Total Credits: 19.50
No. of Lab / Sessional Courses: 5

g. 4th Year 1st Semester

Sl. No.	Course No.	Course Title	Hours/Week		Credits
			Theory	Sessional	
1.	CSE 4000	Project and Thesis	-	6.00	3.00
2.	CSE 4002	Industrial Training	-	1.50	0.75
3.	CSE 4211	Compiler Design	3.00	-	3.00
4.	CSE 4212	Compiler Design Sessional	-	1.50	0.75
5.		CSE Option 1	3.00	-	3.00
6.		CSE Option 1 Sessional	-	1.50	0.75
7.		CSE Option 2	3.00	-	3.00
8.		CSE Option 2 Sessional	-	1.50	0.75
9.		CSE Option 3	3.00	-	3.00
10.	HSS 4417	Financial and Managerial Accounting	3.00	-	3.00
Total			**15.00**	**12.00**	**21.00**

Contact Hours: 15T + 12S = 27 Hours / Week
No. of Theory Courses: 5
Total Credits: 21.00
No. of Lab / Sessional Courses: 5

CSE Option 1 and 2

Sl. No.	Course No.	Course Title	Hours/Week		Credits
			Theory	Sessional	
1.	CSE 4311	Geographical Information System	3.00	-	3.00
2.	CSE 4312	Geographical Information System Sessional	-	1.50	0.75
3.	CSE 4511	Computer Graphics	3.00	-	3.00
4.	CSE 4512	Computer Graphics Sessional	-	1.50	0.75
5.	CSE 4513	Computational Geometry	3.00	-	3.00
6.	CSE 4514	Computational Geometry Sessional	-	1.50	0.75
7.	CSE 4611	Machine Learning	3.00	-	3.00
8.	CSE 4612	Machine Learning Sessional	-	1.50	0.75
9.	CSE 4713	Simulation and Modeling	3.00	-	3.00
10.	CSE 4714	Simulation and Modeling Sessional	-	1.50	0.75

CSE Option 3

Sl. No.	Course No.	Course Title	Hours/Week		Credits
			Theory	Sessional	
1.	CSE 4411	E-commerce and Internet Security	3.00	-	3.00
2.	CSE 4413	Communication Engineering	3.00	-	3.00
3.	CSE 4515	Graph Theory	3.00	-	3.00
4.	CSE 4613	Human Computer Interaction	3.00	-	3.00
5.	CSE 4811	Digital Signal Processing	3.00	-	3.00

h. 4th Year 2nd Semester

Sl. No.	Course No.	Course Title	Hours/Week		Credits
			Theory	Sessional	
1.	CSE 4000	Project and Thesis	-	6.00	3.00
2.	CSE 4004	Ethics in Computer Science and Engineering	-	1.50	0.75
3.	CSE 4721	Software Engineering	3.00	-	3.00
4.	CSE 4722	Software Engineering Sessional	-	1.50	0.75
5.		CSE Option 4	3.00	-	3.00
6.		CSE Option 4 Sessional	-	1.50	0.75
7.		CSE Option 5	3.00	-	3.00
8.		CSE Option 6	3.00	-	3.00
9.	HSS 4427	Economics and Entrepreneurship for IT	3.00	-	3.00

Total	15.00	10.50	20.25

Contact Hours: 15T + 10.50S = 25.50 Hours / Week
Total Credits: 20.25

No. of Theory Courses: 5
No. of Lab / Sessional Courses: 4

CSE Option 4

Sl. No.	Course No.	Course Title	Hours/Week		Credits
			Theory	Sessional	
1.	CSE 4621	Neural Networks and Pattern Recognition	3.00	-	3.00
2.	CSE 4622	Neural Networks and Pattern Recognition Sessional	-	1.50	0.75
3.	CSE 4623	Bioinformatics	3.00	-	3.00
4.	CSE 4624	Bioinformatics Sessional	-	1.50	0.75
5.	CSE 4821	VLSI Design	3.00	-	3.00
6.	CSE 4822	VLSI Design Sessional	-	1.50	0.75
7.	CSE 4823	Digital Image Processing	3.00	-	3.00
8.	CSE 4824	Digital Image Processing Sessional	-	1.50	0.75

CSE Option 5 and 6

Sl. No.	Course No.	Course Title	Hours/Week		Credits
			Theory	Sessional	
1.	CSE 4321	Big Data Analytics	3.00	-	3.00
2.	CSE 4421	Cyber Physical System	3.00	-	3.00
3.	CSE 4521	Parallel and Distributed Processing	3.00	-	3.00
4.	CSE 4523	Algorithm Engineering	3.00	-	3.00
5.	CSE 4625	Robotics and IOT	3.00	-	3.00
6.	CSE 4723	Information System Management	3.00	-	3.00
7.	CSE 4725	Knowledge Engineering	3.00	-	3.00
8.	CSE 4727	Decision Support System	3.00	-	3.00
9.	CSE 4825	Fault Tolerant System	3.00	-	3.00
10.	CSE 4827	Advanced Computer Architecture	3.00	-	3.00
11.	CSE 4829	High Performance Computing	3.00	-	3.00