Part B

17 Structure of the Curriculum

(a) **Duration of the program**: 4 Years/8 Semesters.

(b) **Admission Requirements**: At the Green University of Bangladesh, the Undergraduate Admission Eligibility is described as follows:

- A minimum GPA of 2.5/2nd division/equivalent grade in SSC and HSC or equivalent public examinations. However, students with a GPA 2.00 in any examination either SSC or HSC must have a minimum GPA of 6.00 totaling the GPA of both the examinations.
- Candidates must have passed the University of London and Cambridge GCE O Level in at least five subjects and A Level in at least two subjects. Only the best five subjects in 'O' Level and best two subjects in 'A' Level will be considered. Out of these seven subjects, a candidate must have at least 4 B's or GPA of 4.00 in the four subjects and 3 C's or GPA of 3.5 in the remaining three subjects. (in the scale of A=5, B=4, C=3, D=2 and E=1.
- Diploma in Engineering under the Bangladesh Technical Education Board (BTEB) or equivalent, with at least a second division or a minimum GPA of 2.5.
- For admission to the programs of the Faculty of Science and Engineering, students must have had Physics, Chemistry, and Mathematics with satisfactory scores in HSC/A-Level or equivalent level. Candidates not having Mathematics or failing in Mathematics at HSC/A-levels must take a remedial course on Mathematics in addition to the courses required for the program.
- The students, who are sons/daughters of freedom fighters, will be eligible for admission if they have a minimum GPA of 5.00 totaling the GPA of SSC and HSC Examinations. Such students are requested to submit attested photocopies of (i) a "Provisional Certificate" from the Ministry of Liberation War Affairs. (ii) Mukti Barta (iii) Gazette (iv) "National ID" of the freedom fighter. (v) Birth Certificate / Death Certificate of the Freedom Fighter. (vi) Database of Freedom Fighters Information (vii) Government allowance book.

(c) **Total minimum credit requirement to complete the program**: According to BNQF (Part B) for Higher Education: 144 Credits.

(d) **Total class weeks in a Year/semester**: 15 weeks/semester.

(e) **Minimum CGPA requirements for graduation**: 2.5

(f) **Maximum academic years of completion**: 8 (Eight) Years.

(g) **Category of Courses**:

(i) General Education Courses: (Interdisciplinary courses, beyond the discipline/program, that provide a well-rounded learning experience to the students of an academic program) For ex-

ample Arts and Humanities, Social Sciences, ICT, Basic Science/STEM, etc. (as applicable for the disciplined academic program)

Sl	Course Code	Course Title	Credit
1	GED 0232-101	Functional Bengali	2
2	GED 0222-201	History of the Emergence of Bangladesh	2
3	GED 0412-301	Business Communication	3
4	GED 0413-303	Industrial and Operational Management	3
5	GED 0415-305	Technology Entrepreneurship	3
6	GED 0223-307	Professional Ethics and Environmental Protection	2
7	GED 0314-309	Society and Technology	3
8	ESP 0232-009	Academic English	0
9	ESP 0232-101	Academic English I	3
10	ESP 0232-103	Professional English	2
11	PHY 0533-101	Physics	3
12	PHY 0533-102	Physics Lab	1
13	MAT 0541-009	Remedial Math	0
14	MAT 0541-101	Calculus	3
15	MAT 0541-103	Linear Algebra and Vector Analysis	3
16	MAT 0541-201	Probability and Statistics I	3
17	MAT 0541-203	Probability and Statistics II	3
18	EEE 0713-201	Introduction to Electrical and Electronic Circuits	3
19	EEE 0713-202	Introduction to Electrical and Electronic Circuits Lab	1
20	PSD 0031-400	Professional Life Skills Development	0

(ii) Core courses (Courses that characterize the discipline):

Sl	Course Code	Course Title	Credit
1	SWE 0613-101	Discrete Mathematics	3
2	SWE 0613-103	Structured Programming	3
3	SWE 0613-104	Structured Programming Lab	1.5
4	SWE 0613-105	Introduction to Software Engineering	3
5	SWE 0613-107	Data Structures	3
6	SWE 0613-108	Data Structures Lab	1.5
7	SWE 0613-109	Digital Logic Design	3
8	SWE 0613-110	Digital Logic Design Lab	1
9	SWE 0613-201	Algorithms	3
10	SWE 0613-202	Algorithms Lab	1.5
11	SWE 0613-203	Object Oriented Programming	3
12	SWE 0613-204	Object Oriented Programming lab	1.5
13	SWE 0612-205	Database Systems	3
14	SWE 0612-206	Database Systems Lab	1.5
15	SWE 0613-207	Operating Systems	3
16	SWE 0613-208	Operating Systems Lab	1

17	SWE 0613-209	Microprocessor and Computer Architecture	3
18	SWE 0613-210	Assembly Language Programming Lab	1
19	SWE 0613-211	Software Requirements Engineering	3
20	SWE 0613-301	Web Engineering and Technology	3
21	SWE 0613-302	Web Engineering and Technology Lab	1.5
22	SWE 0613-303	Software Architecture and Design	3
23	SWE 0613-306	Software Project Development I	1.5
24	SWE 0612-307	Internet Protocols and Applications	3
25	SWE 0612-308	Internet Protocols and Applications Lab	1.5
26	SWE 0613-315	Software Design Patterns	3
27	SWE 0613-317	Artificial Intelligence	3
28	SWE 0613-318	Artificial Intelligence Lab	1.5
29	SWE 0613-320	Software Project Development II	1.5
30	SWE 0613-401	Software Testing and Quality Assurance	3
31	SWE 0613-403	Malware Attack and Reverse Engineering	3
32	SWE 0613-405	Software Project Management	3
33	SWE 0613-407	Distributed Systems	3
34	SWE 0613-417	Software Security	3
35	SWE 0613-419	Software Maintenance and Reengineering	3

(iii) Elective Courses (Courses for specialization within the discipline):

Sl	**Course Code**	**Course Title**	**Credit**
1	SWE 0613-309	Numerical Methods in Software and Analysis	3
2	SWE 0613-311	Simulation and Modelling	3
3	SWE 0613-313	New Product Development and Innovation	3
4	SWE 0613-321	Embedded Software for IoT	3
5	SWE 0613-323	Mobile Application Development	3
6	SWE 0613-325	Compiler Design	3
7	SWE 0613-327	Cloud Computing	3
8	SWE 0613-322	Embedded Software for IoT Lab	1
9	SWE 0613-324	Mobile Application Development Lab	1
10	SWE 0613-326	Compiler Design Lab	1
11	SWE 0613-328	Cloud Computing Lab	1
12	SWE 0613-409	Machine Learning	3
13	SWE 0613-411	Data Mining	3
14	SWE 0613-413	Natural Language Processing	3
15	SWE 0613-415	Big Data Analytics	3
16	SWE 0613-410	Machine Learning Lab	1
17	SWE 0613-412	Data Mining Lab	1
18	SWE 0613-414	Natural Language Processing Lab	1
19	SWE 0613-416	Big Data Analytics Lab	1
20	SWE 0613-423	Introduction to Blockchain Systems	3
21	SWE 0613-425	Introduction to Game Development	3

22	SWE 0613-427	Data Science	3
23	SWE 0613-429	Human Computer Interaction	3

(iv) Capstone course/Internship/Thesis/Projects/Portfolio (as applicable for the discipline/ academic program)

Sl	Course Code	Course Title	Credit
1	SWE 0613-400	Project/Thesis	6
2	SWE 0613-422	Internships	3

18 Year/Level/Semester/Term wise distribution of courses

The courses of the Bachelor of Science in Software Engineering are arranged and distributed among eight semesters based on the hierarchical need of the courses. In the following, semester-wise courses are listed along with relevant information.

18.1 Fresher: Year-1, Semester-1

Course Code	Course Title	Credit	Prerequisite
ESP 0232-009*	Academic English	0	
MAT 0541-009*	Remedial Math	0	
SWE 0613-101	Discrete Mathematics	3	
SWE 0613-103	Structured Programming	3	
SWE 0613-104	Structured Programming Lab	1.5	
ESP 0232-101	Academic English I	3	
PHY 0533-101	Physics	3	
PHY 0533-102	Physics Lab	1	
MAT 0541-101	Calculus	3	
	Total	17.5	

* These courses will be only offered to the deserving students.

18.2 Fresher: Year-1, Semester-2

Course Code	Course Title	Credit	Prerequisite
SWE 0613-105	Introduction to Software Engineering	3	
SWE 0613-107	Data Structures	3	SWE 0613-103
SWE 0613-108	Data Structures Lab	1.5	
SWE 0613-109	Digital Logic Design	3	
SWE 0613-110	Digital Logic Design Lab	1	
ESP 0232-103	Professional English	2	
MAT 0541-103	Linear Algebra and Vector Analysis	3	MAT 0541-101
GED 0232-101	Functional Bengali	2	
	Total	18.5	

18.3 Sophomore: Year-2, Semester-1

Course Code	Course Title	Credit	Prerequisite
SWE 0613-201	Algorithms	3	SWE 0613-107
SWE 0613-202	Algorithms Lab	1.5	
SWE 0613-203	Object Oriented Programming	3	SWE 0613-103
SWE 0613-204	Object Oriented Programming lab	1.5	
EEE 0713-201	Introduction to Electrical and Electronic Circuits	3	
EEE 0713-202	Introduction to Electrical and Electronic Circuits Lab	1	
MAT 0541-201	Probability and Statistics I	3	
GED 0222-201	History of the Emergence of Bangladesh	2	
	Total	18	

18.4 Sophomore: Year-2, Semester-2

Course Code	Course Title	Credit	Prerequisite
SWE 0612-205	Database Systems	3	SWE 0613-107
SWE 0612-206	Database Systems Lab	1.5	
SWE 0613-207	Operating Systems	3	
SWE 0613-208	Operating Systems Lab	1	
SWE 0613-209	Microprocessor and Computer Architecture	3	
SWE 0613-210	Assembly Language Programming Lab	1	
SWE 0613-211	Software Requirements Engineering	3	SWE 0613-105
MAT 0541-203	Probability and Statistics II	3	MAT 0541-201
	Total	18.5	

18.5 Junior: Year-3, Semester-1

Course Code	Course Title	Credit	Prerequisite
SWE 0613-301	Web Engineering and Technology	3	SWE 0612-205
SWE 0613-302	Web Engineering and Technology Lab	1.5	
SWE 0613-303	Software Architecture and Design	3	SWE 0612-205
SWE 0613-306	Software Project Development I	1.5	SWE 0613-203 SWE 0612-205
SWE 0612-307	Internet Protocols and Applications	3	
SWE 0612-308	Internet Protocols and Applications Lab	1.5	
	Business (Any one of the following three courses)	3	
GED 0412-301	Business Communication		
GED 0413-303	Industrial and Operational Management		
GED 0415-305	Technology Entrepreneurship		
	Optional I (Any one of the following three courses)	3	
SWE 0613-309	Numerical Methods in Software and Analysis		
SWE 0613-311	Simulation and Modelling		
SWE 0613-313	New Product Development and Innovation		
	Total	19.5	

18.6 Junior: Year-3, Semester-2

Course Code	Course Title	Credit	Prerequisite
SWE 0613-315	Software Design Patterns	3	SWE 0613-303
SWE 0613-317	Artificial Intelligence	3	
SWE 0613-318	Artificial Intelligence Lab	1.5	
SWE 0613-320	Software Project Development II	1.5	SWE 0613-306
GED 0223-307	Professional Ethics and Environmental Protection	2	
GED 0314-309	Society and Technology	3	
	Optional IIa (Any One courses with corresponding lab)	3	
SWE 0613-321	Embedded Software for IoT		
SWE 0613-323	Mobile Application Development		SWE 0613-201
SWE 0613-325	Compiler Design		
SWE 0613-327	Cloud Computing		
	Optional IIb (Any One corresponding labs)	1	
SWE 0613-322	Embedded Software for IoT Lab		
SWE 0613-324	Mobile Application Development Lab		
SWE 0613-326	Compiler Design Lab		
SWE 0613-328	Cloud Computing Lab		
	Total	18	

18.7 Senior: Year-4, Semester-1

Course Code	Course Title	Credit	Prerequisite
SWE 0613-401	Software Testing and Quality Assurance	3	SWE 0613-315
SWE 0613-403	Malware Attack and Reverse Engineering	3	
SWE 0613-405	Software Project Management	3	
SWE 0613-407	Distributed Systems	3	
SWE 0613-400A	Project/Thesis	3	
	Optional IIIa (Any One courses with corresponding lab)	3	
SWE 0613-409	Machine Learning		
SWE 0613-411	Data Mining		
SWE 0613-413	Natural Language Processing		
SWE 0613-415	Big Data Analytics		
	Optional IIIb (Any One corresponding labs)	1	
SWE 0613-410	Machine Learning Lab		
SWE 0613-412	Data Mining Lab		
SWE 0613-414	Natural Language Processing Lab		
SWE 0613-416	Big Data Analytics Lab		
	Total	19	

18.8 Senior: Year-4, Semester-2

Course Code	Course Title	Credit	Prerequisite
SWE 0613-417	Software Security	3	
SWE 0613-419	Software Maintenance and Reengineering	3	SWE 0613-401
SWE 0613-422	Internships	3	
SWE 0613-400B	Project/Thesis	3	
PSD 0031-400	Professional Life Skills Development	0	
	Optional IV (Any one of the following courses)	3	
SWE 0613-423	Introduction to Blockchain Systems		
SWE 0613-425	Introduction to Game Development		
SWE 0613-427	Data Science		
SWE 0613-429	Human Computer Interaction		
	Total	15	