# DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
## BANGLADESH UNIVERSITY OF BUSINESS AND TECHNOLOGY

# COURSE OUTLINE

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| 1 | **Faculty** | Faculty of Engineering & Applied Sciences (FEAS) |
| 2 | **Department** | Department of Computer Science and Engineering |
| 3 | **Program** | B.Sc. Engg. in Computer Science and Engineering (B. Sc. Engg. in CSE) |
| 4 | **Course Code** | CSE 102 |
| 5 | **Course Title** | Structured Programming Language Lab |
| 6 | **Course Type** | Core Course |
| 7 | **Pre-requisites** | |
| 8 | **Credit Hours/Value** | 1.5 |
| 9 | **Contact Hours** | 17 weeks × 1 class per week × 2.5 hours per class = 42.5 total hours |
| 10 | **Year- Semester** | 1 - 1 |
| 11 | **Academic Session** | Fall 2025 |

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| 12 | **Class Schedule** | **Intake – Section (Shift)** | **Class Day** | **Class Hours** | **Venue** |
| | | 56–7 (Day) | Wednesday | 04:00 pm – 06:30 pm | B2/217 |
| | | BUBT Campus, Rupnagar, Mirpur 2, Dhaka - 1216 | | | |
| 13 | **Course Website** | **Google Classroom Code:** qiah6cm4 **Meet Link:** https://meet.google.com/tnp-movf-voa | | | |
| 14 | **Course Teacher's Information** | **Name (Code):** Sourav Kundu (SKD) | | **Specialization**: Structured Programming, Object Oriented Programming, Software Engineering. | |
| | | **Designation**: Lecturer, Department of CSE | | **Email:** souravkundu@bubt.edu.bd | |
| | | | | **Cell No.** +8801639881090 | **Room No.** 408 (B-3) |

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| 15 | **Counselling Hour/Tutorial** | **Day** | **Counseling Hours** | **Venue** |
| | | Sunday | 10:30 am – 11:45 am | B3/408 |
| | | Monday | 10:30 am – 11:45 am | |
| | | Wednesday | 02:45 pm – 04:00 pm | |

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| 16 | **Accessories & Aids** | Students must carry learning materials like lecture notes, calculator, pen, pencil, eraser etc. in the classroom. Borrowing learning materials in the classroom or exam room from fellow students is prohibited. A student is also advised to keep a separate class note (khata) of 50 pages for the course during class hours. |
| 17 | **Course Rationale** | This sessional (lab) course is based on the theory course CSE-101 Structured Programming Language. This course manual provides students with the weekly schedule in more detail so that they can gaze what basic programming things will be taught and how to apply them combined with various problem-solving techniques to solve problems of different levels and categories. |
| 18 | **Course Objective** | This sessional (lab) course introduces the fundamental concepts of structured programming language. In this course, students will be able to develop logics which will help them to create programs, applications using C programming language. It emphasizes that the students learn to determine suitable logic for solving programming related problems using C language and start preparing themselves for competitive programming world. |
| 19 | **Course Learning** | Upon completing this course, students will be able to:<br><br>**CLO1: Demonstrate** different data structures and related algorithms. |

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| | **Outcomes (CLOs)** | **CLO2: Apply** different data structures and algorithms to solve computational problems.<br><br>**CLO3: Analyze** the efficiency of the solutions designed for different problem scenarios. |

**20 Mapping of CO – PO Method of Delivery and Assessment Tool**

| CLOs | PLOs &CF | Bloom's Domain / Level | Delivery Methods / Activities | Assessment Tools |
|---|---|---|---|---|
| CLO1 | PLO1 CF = 2 | Cognitive/Understanding | ⊙ Classroom Lecture (PPP &/or WBT*)<br>⊙ Classroom Discussion& Exercise practice<br>⊙ Analysis and design problem solving<br>⊙ Course Counseling | ***Indirect*:** In class response, course counseling, course end survey<br>***Direct*:** Class participation and activity, class test, assignment, midterm and final examinations |
| CLO2 | PLO2 CF = 3 | Cognitive/Understanding | | |
| CLO3 | PLO3 CF = 3 | Cognitive/Analyzing | | |

*PPP: Power Point Presentation & WBL: White Board Teaching

**Correlation of COs to POs**

| Correlation Criteria | Correlation Level | Correlation Factor (CF) |
|---|---|---|
| Less than 25% | Almost no correlation | 0 |
| Equal to or greater than 25% and below50% | Poor (Low) | 1 |
| Equal to or greater than 50% and below 75% | Moderate (Medium) | 2 |
| Equal to or greater than 75%and up to 100% | Significant (High) | 3 |

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| **21** | **Teaching-Learning Strategy** | The course's teaching-learning process is designed to achieve its intended learning outcomes. Various classroom tools, such as multimedia projectors with desktop computers, whiteboards, and overhead projectors, are used to make the process engaging, effective, and comprehensive. The primary method of teaching is through classroom lectures, wherein most of the course content is covered in the lecture notes. For the remaining topics, textbooks are utilized, with additional references provided for students to study on their own. Lecture materials are posted on Google Classroom web pages and also provided as hard copies in the classroom. To ensure that students achieve the expected performance and knowledge level, classroom discussions, PowerPoint presentations, problem-solving using whiteboard markers, and homework or home studies are used. Counseling is also offered to help students with weak areas. Formative assessments of individual students are done through inside and outside classroom discussions, in-class eye contact and clicker questions, homework, and students' responses. A course-end survey is also conducted. Summative assessments are done through class participation and performance observation, assignments, class tests, and semester midterm and final examinations.<br><br>If a student is absent from a class for any reason, they are advised to do self-study and take tutorials from the class teacher to make up for the missed class. Supplementary examinations are available for students who missed the midterm or final examinations due to valid reasons. These supplementary exams are more challenging than the regular exams. |

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| **22** | **Course Plan**<br>This course consists of 150.0 min./week of class contact hours and an additional 90 min./week of counseling hours to explain students' design problems, provide reading materials, and assist in understanding lecture materials for preparing examinations, Lab tests, and assignments. |

| Week | Selected Topics | Lecture Note, Text Book& Other Ref. | Teaching Learning Strategy | Assessment Strategy | Corresponding CLOs |
|---|---|---|---|---|---|
| 1-2 (Week 1) | Introduction to programming tools and basic structure of C program implementation. | | Lecture, Video Presentation | Lab Performance Evaluation | CO1 |
| 3-4 (Week 2) | Implementing Conditional statements and operators.<br>**Lab Performance Evaluation** | | Lecture discussion with White Board and Multimedia, Problem Solving | | CO1 |
| 5-6 (Week 3) | Hands on for loop, while loop and DO while loop. | | | | CO2 |
| 7-8 (Week 4) | Solving problems with different Loops and Nested for Loop.<br>**Lab Performance Evaluation** | | | | CO2 |
| 9-10 (Week 5) | Implementation of switch case structure, break and continue statement and its application. | | | | CO2 |
| 11-12 (Week 6) | Function, passing arguments to a function.<br>**Lab Performance Evaluation** | | | | CO2 |
| 13-14 (Week 7) | One dimensional Arrays, Array input, output and traversing<br>Two dimensional arrays and operations with them | | Lectures, Questions and answers | | CO1 |
| Week 8 | **Mid Term Lab Examination** | | | | |
| 15-16 (Week 9) | Recursive Function and solving problems using recursion<br>**Lab Performance Evaluation** | | Lecture discussion with White Board and Multimedia, Problem Solving | Lab Performance Evaluation | CO2 |
| 17-18 (Week 10) | Strings, operation with strings and string functions<br>**Lab Performance Evaluation** | | | | CO2 |
| 19-20 (Week 11) | String Manipulation: how to copy, compare, reverse string and string catenation using library functions | | | | CO2 |
| 21-22 (Week 12) | Pointers and use of pointers, using pointers interchangeably with strings, use of pointer with functions.<br>**Lab Performance Evaluation** | | | | CO2 |
| 23-24 (Week 13) | File, Basic file operations: Create, Open, Read, Write, Copy, Delete. Structures: Create a suitable structure, Use of them to solve problems, use of typedef etc. | | | | CO2 |
| 25-26 (Week 14) | Introduction to Online Judge and competitive programming. | | | | CO2 |
| 27-28 (Week 15) | Practice ACM problems (URI, UVA etc. Online Judges)<br>**Lab Performance Evaluation** | | Discussion and Problem Solving | Lab Evaluation | CO3 |
| Week 16 | **Final Lab Examination** | | | | |

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| 23 | **i. Text Books** | **1.** Teach Yourself C, 3rd Edition, by Herbert Schildt |
| | **ii. Reference Books** | **1.** Programming in ANSI C, 8th Edition, by E. Balagurusamy |

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| 24 | **Assessment and marks distribution criteria** | Active engagement in class activities, participation in outside classroom discussions, and communication through the Internet and phone are integral parts of this course. Failure to participate in class regularly, take class tests, and/or complete assignments may result in failing the course. To achieve the course-specific expectations, students must actively participate in classroom discussions and complete all sets of work at a satisfactory level, as outlined in the course content. The course-specific expectations for students are achieved if |

- ⊙ 75% of students in a section attend more than 70% of classes (determined by summative assessment).
- ⊙ Their active participation in the classroom discussion is targeted at up to 80% of the total attendees (determined by formative assessments such as eye contact, clicker questions, and group discussions).
- ⊙ Equal or more than 40% of course outcomes must be achieved by the students (summative assessment).
- ⊙ The level of engagement in the studies, such as regularly preparing class lectures, class tests, and assignments, must be more than 60% (formative assessment).
- ⊙ Expected level of participation in the outside class discussion (once weak, more than 30% of students in a section) by course counseling and using social media like Google Classroom, email, phone call, etc. (formative assessment).
- ⊙ Students are assessed according to their individual performance in the examinations, class tests, assignments, and class participation. The final mark calculation and course outcome assessment are done based on the following mark distribution criteria:

| Assessment tool | Conducting Number | Mark distribution (%) |
|---|---|---|
| Class participation | 17 | 05 |
| Continuous Lab Evaluation & Assignments | 1 | 25 |
| Lab Mid Exam | 1 | 30 |
| Final Lab Evaluation & Report | 1 | 40 |
| | Total Marks | 100 |

**Class participation & activity performance criteria**

| Performance level | Mark distribution (%) |
|---|---|
| 91% - 100% | 05 |
| 86% - 90% | 04 |
| 81% - 86% | 03 |
| 76% - 80% | 02 |
| 70% - 75% | 01 |
| less than 70% | Not allowed to sit for the final examination. |

**25 Assessment Strategy**

| Assessment tool | Content, Length and Criteria | Weight (mark) | Due date |
|---|---|---|---|
| Lab Performance Evaluation & | Lab performance evaluations occur following the completion of each classroom topic. A total of 30 marks are allocated for the assessment of lab performance in relation to the practiced material. | 25 | After each lecture and following the |

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| | Assignments | | | examination schedule of BUBT. |
| | Lab Mid Exam | Midterm Examination is held after 7 weeks of classes. Three questions are to be answered by the students in one and half-hour exam period. The assigned full mark for three (3) questions is 30. | 30 | After 7 weeks' lecture and following the examination schedule of BUBT. |
| | Final Project Evaluation | Final Lab Examination is held after 8 weeks of classes after the midterm examination. All of the students make a group and each group is assigned a project by the course teacher. The assigned full mark for the exam is 40. | 40 | After 9 weeks of classes afterward the midterm examination and following the examination schedule of BUBT. |

| **26** | **CLO Assessment Criteria** | **Assessment of CLOs** | | | | |
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| | | **Assessment Tool** | **CLO** | | | **Mark Allocation** |
| | | | **CLO1** | **CLO2** | **CLO3** | |
| | | Class Participation | | | | |
| | | Continuous Lab Evaluation & Assignments | | | | |
| | | Lab Mid Exam | 10 | 20 | | 30 |
| | | Final Project | | 10 | 30 | 40 |
| | | Total Marks | 10 | 30 | 30 | 70 |

| **27** | **Rubrics (Attainment Criteria)** | **CLOs (Taxonomy domain)** | **Not attained /Failed (0-39%)** | **Poor (40%-49%)** | **Moderate (50%-64%)** | **Good (65%-79%)** | **Excellent (80%-100%)** |
|---|---|---|---|---|---|---|---|
| | | CLO1 (understand)<br>CLO2 (understand and apply)<br>CLO3 (apply) | The question was answered with serious deficiencies in understanding and explanation. Applicable method was not almost touched. | The question was answered inadequately by touching on the applicable method or without explanations. As a result, a few steps of problem-solving procedures or concepts are not developed properly or are missing. | The question was answered partially correctly by applying the method or concepts asked, but a few important details were missing. | The question was answered correctly but briefly, and missed some portions of the important explanation by applying the required method or concepts. | The question was answered correctly with detailed explanations using the asking method of solving the problem or concepts with adequate explanation. |

| **28** | **Feedback** | All kinds of feedback to the students will be produced within a week after the day of holding a class test and midterm examination. No answer script will be shown for the final examination if it is not challenged by a student. Online and email queries will also be responded to within three days by email. |
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| **29** | **Grading Policy** | Letter grades and grade points are used to evaluate the performance of a student in the course: | | |
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| | | **Marks Range** | **Letter Grade** | **Grade Point** |
| | | 80% and above | A+ : A Plus (Outstanding) | 4.00 |
| | | 75% to less than 80% | A : A regular (Excellent) | 3.75 |
| | | 70% to less than 75% | A- : A minus (Very good) | 3.50 |

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| | | 65% to less than 70% | B+ | : B Plus (Good) | 3.25 |
| | | 60% to less than 65% | B | : B regular (Average) | 3.00 |
| | | 55% to less than 60% | B- | : B minus (Below average) | 2.75 |
| | | 50% to less than 55% | C+ | : C Plus (Poor) | 2.50 |
| | | 45% to less than 50% | C | : C regular (Very poor) | 2.25 |
| | | 40% to less than 45% | D | : Pass marginally | 2.00 |
| | | Less than 40% | F | : Fail | 0.00 |
| | | | I | : Incomplete | |
| | | | R | : Retake | |
| | | | W | : Withdraw | |

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| 30 | **Additional Information** | Academic Calendar Fall2023: https://www.bubt.edu.bd/Home/page_details/Academic_Calender<br>Academic Rules: https://www.bubt.edu.bd/Home/page_details/Rules_and_Regulations<br>Grading & Evaluation: https://www.bubt.edu.bd/Home/page_details/Evaluation_Grading_System<br>Rules& Regulations: https://www.bubt.edu.bd/Home/page_details/Office_of_the_Registrar |

**31 Bloom's Taxonomy for Teaching-Learning**

Bloom's Taxonomy is a set of three hierarchical models used to classify educational learning objectives into levels of complexity and specific quality. The three taxonomy domains for achieving learning objectives are cognitive, affective, and psychomotor. Cognitive domain is in the primary focus of educating and frequently used to structure curriculum learning objectives and achieve the levelof learning. The three domains and their respective levels are illustrated below:

| **Cognitive [C]** (Knowledge-based) | **Affective [A]** (Emotion-based) | **Psychomotor [P]** (Action-based) |
|---|---|---|
| Remember | Receive | Imitate |
| Understand | Respond | Manipulate |
| Apply | Value | Precision |
| Analyze | Organize | Articulation |
| Evaluate | Characterize | Naturalization |
| Create | --- --- --- | --- --- --- |

**32 Descriptions of Cognitive Domain (Anderson and Krathwohl's updated Taxonomy in 2001):**

The **cognitive domain** involves the development of our mental skills and the acquisition of knowledge.

| **Category (Level)** | **Meaning** | **Keywords** |
|---|---|---|
| Remember (C1) | Recognizing or recalling knowledge from memory. Remembering is when memory is used to produce or retrieve definitions, facts, or lists, or to recite previously learned information. | Define, describe, draw, find, identify, label, list, match, name, quote, recall, recite, tell, and write |
| Understand (C2) | Constructing meaning from different types of functions be they written or graphic messages or activities like interpreting, exemplifying, classifying, summarizing, inferring, comparing, or explaining. | Classify, compare, exemplify, conclude, demonstrate, discuss, explain, identify, illustrate, interpret, paraphrase, predict, and report |
| Apply (C3) | Carrying out or using a procedure through executing or implementing. Applying relates to or refers to situations where learned material is used through products like models, presentations, interviews, or simulations. | Apply, change, choose, compute, dramatize, implement, interview, prepare, produce, role play, select, show, transfer, and use |
| Analyze (C4) | Breaking materials or concepts into parts, determining how the parts relate to one another or how they interrelate, or how the parts relate to an overall structure or purpose. Mental actions included in this function are differentiating, organizing, and attributing, as well as being able to distinguish between the components or parts. When one is analyzing, he/she can illustrate this mental function by creating spreadsheets, surveys, charts, or diagrams, or graphic representations. | Analyze, characterize, classify, compare, contrast, debate, deconstruct, deduce, differentiate, discriminate, distinguish, examine, organize, outline, relate, research, separate, and structure |

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| | Evaluate (C5) | Making judgments based on criteria and standards through checking and critiquing. Critiques, recommendations, and reports are some of the products that can be created to demonstrate the processes of evaluation. | Appraise, argue, assess, choose, conclude, decide, evaluate, judge, justify, predict, prioritize, prove, rank, rate, select, Monitor. |
| | Create (C6) | Putting elements together to format coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing. Creating requires users to put parts together in a new way, or synthesize parts into something new and different creating a new form or product. This process is the most difficult mental function in the new taxonomy. | Create, invent, compose, predict, plan, construct, design, propose, devise, and formulate |

## 33 Graduate Attributes (Program Learning Outcomes) of B.Sc. in CSE Program based on Washington Accord

Program Learning Outcomes (PLOs) are brief statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and attitudes that students acquire throughout the entire course of a program. The students of the B.Sc. in CSE program are expected to achieve the following graduate attributes or program outcomes at the time of graduation:

**PLO1.** Apply knowledge of mathematics, natural science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**PLO2.** Identify, formulate, and analyze complex engineering problems reaching substantiated conclusions using the first principles of mathematics and natural and engineering sciences.

**PLO3.** Design solutions for complex engineering problems and design systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

**PLO4.** Conduct investigations of complex problems using research-based knowledge and research methods that include the design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

**PLO5.** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex engineering problems, with an understanding of the limitations.

**PLO6.** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

**PLO7.** Understand and evaluate the sustainability and impact of professional engineering work to solve complex engineering problems in societal and environmental contexts.

**PLO8.** Apply ethical principles and commit to professional ethics, responsibilities, and norms of engineering practice.

**PLO9.** Function effectively as individuals and members or leaders of diverse teams and in multidisciplinary settings.

**PLO10.** Communicate effectively on complex engineering activities with the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and convey and receive clear instructions.

**PLO11.** Demonstrate knowledge and understanding of engineering and management principles and apply them to their work as team members or leaders or entrepreneurs to manage projects in multidisciplinary environments.

**PLO12.** Recognize self-awareness to engage in a lifelong learning process to reflect in the broadest context of technological change.

## 34 Knowledge Profile (K)

**K1:** A systematic, theory-based understanding of the natural sciences applicable to the discipline.

**K2:** Conceptually-based mathematics, numerical analysis, statistics and formal aspects of computer and information science to support analysis and modeling applicable to the discipline.

**K3:** A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.

**K4:** Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline much is at the forefront of the discipline.

**K5:** Knowledge that supports engineering design in a practice area.

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| | **K6:** Knowledge of engineering practice (technology) in the practice areas in the engineering discipline.<br>**K7:** Comprehension of the role of engineering in society and identified issues in engineering practice in the discipline: ethics and the professional responsibility of an engineer to public safety; the impacts of engineering activity: economic, social, cultural, environmental and sustainability.<br>**K8:** Engagement with selected knowledge in the research literature of the discipline. |

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| **35** | **Range of Complex Engineering Problem Solving (P)** |
| | Complex Engineering Problems have characteristic **P1** and several or all of **P2** to **P7**:<br>**P1. Depth of knowledge required**: Cannot be resolved without in-depth engineering knowledge at the level of one or more of K3, K4, K5, K6 or K8, which allows a fundamentals-based, first principles analytical approach<br>**P2. Range of conflicting requirements**: Involve wide-ranging or conflicting technical, engineering and other issues<br>**P3. Depth of analysis required**: Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models<br>**P4. Familiarity of issues**: Involve infrequently encountered issues<br>**P5. Extent of applicable codes:** Are outside problems encompassed by standards and codes of practice for professional engineering<br>**P6. Extent of stakeholder involvement and conflicting requirements**: Involve diverse groups of stakeholders with widely varying needs<br>**P7. Interdependence**: Are high-level problems including many component parts or sub-problems |

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| **36** | **Range of Complex Engineering Activities (A)** |
| | Attribute Complex activities means (engineering) activities or projects that have several or all of the following characteristics:<br>**A1. Range of resources**: Involve the use of diverse resources (and for this purpose resources include people, money, equipment, materials, information and technologies).<br>**A2. Level of interaction**: Require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering, or other issues.<br>**A3. Innovation**: Involve creative use of engineering principles and research-based knowledge in novel ways.<br>**A4. Consequences for society and the environment**: Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation.<br>**A5. Familiarity**: Can extend beyond previous experiences by applying principles-based approaches. |
| **37** | **Code of Conduct**<br>It is strongly suggested that students keep discipline in the classroom by attending class on time, listening to lectures attentively, and participating in discussions on the subject. To get class participation grades, students MUST attend the classes of the courses s/he registered for. Turn off his or her cell phone before entering a class or participating in class tests and exams. There are activities that are considered academic misconduct. One of them is plagiarism, which signifies the deliberate formal presentation or submission of works, phrases, texts, ideas, illustrations, or diagrams of others as one's own without proper citation. Another one is the use of unauthorized aids (including electronic devices), asking for assistance, or using illegal materials when preparing assignments or in examinations. In addition, copying from others' work, showing your work to others, and asking for answers are also considered academic misconduct. Penalties for involving academic misconduct include one or more of the following: a zero grade on the work produced, a failing grade in the course, suspension for one semester or more, and even expulsion from the university. On the university premises or at a university-sponsored program, students must abide by the Student Code of Conduct and other Rules and Regulations of BUBT, which are available on the BUBT website at https://www.bubt.edu.bd/Home/page_details/Office_of_the_Proctor. |

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| **38** | **Social & Moral Values** |

Our promises are based on the three cardinal principles:

i. What we do believe.
ii. What we do practice.
iii. What we will promote.

However, students are advised to undertake the following commitments for social and moral developments.

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| • To be punctual and attentive in classes;<br>• To prioritize honesty & faith;<br>• To ensure mutual respect;<br>• To be always proactive;<br>• To avoid conspiracy;<br>• To be cooperative in learning;<br>• To be sincere in class preparation; | • To avoid unfair means and plagiarism in exams, report writings and assignments;<br>• To carry out assignments or keep other commitments timely;<br>• To be motivated for asking question and encourage feedback;<br>• Not to forget to switch-off the cellphone in a class; | • To follow the dress code and wearing ID card on campus;<br>• To be decent on all aspects;<br>• To be loyal and trust-worthy to the teachers and others;<br>• Help keeping an eco-friendly environment in the campus. |

**Prepared by:** **Checked by:** **Approved by:**

**Maruf Billah**
**Lecturer , Dept. of CSE.**