



# **Institute of Information Technology (IIT)**

## **Noakhali Science and Technology University**

**BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING (BSSE)**  
**March 2022**

[nstu.edu.bd](http://nstu.edu.bd)

## Introduction

Institute of Information Technology (IIT) is one of the most glorious Institutes in Noakhali Science and Technology University (NSTU). On 20<sup>th</sup> August 2017, in the 36<sup>th</sup> Academic Council meeting of Noakhali Science and Technology University, the program of Bachelor of Science in Software Engineering (BSSE) has been introduced under the leadership of founder Director of Institute of Information Technology (IIT) **Mr. Mohammad Nuruzzaman Bhuiyan**. At present, **Mr. Md. Auhidur Rahman** is the acting director of IIT since May 2019.

BSSE program is a four-year industry-oriented program. Three years of study is followed by a half-year industry placement before the final semester. Students will be assisted by the Institute in their placement for the internship. They will integrate their industry experience within their studies upon return for their final semester. This will develop students in strong communication skills together with an outward worldly focus, positive personally and business attitudes. BSSE program will enhance student's capability and competence to deliver at different technical roles and management positions.

This program will cover a wide range of software engineering topics for a comprehensive coverage of modern software and techniques. For graduation, students have to complete total 150.0 credit hours. This program offers a common first year which consists of mathematics, sciences, computing, engineering principles, communications and design. BSSE program will provide students with a solid foundation of engineering training and introducing in a variety of engineering disciplines. Students will also gain knowledge in areas such as computer programming, object-oriented methodology, software design, software validation and verification, software security and computer networks in the second and third year. In fourth year first semester, all the students will send in an industry for Industrial Training.

## Program Description

Software engineering is the application of sound engineering principles and techniques to the analysis, design, development, testing and management of software systems. It is an interdisciplinary study of integrating traditional computer science which focuses on software development and related theoretical issues with engineering which emphasizes on designing and building complex, safe, reliable software for general use. Software Engineering is an

Engineering discipline whose focus is the cost-effective development of high quality software systems. It has real-life implications in many industries including medical, communications business, military, aerospace, scientific and general computing. Using principles and techniques of computer science, engineering and mathematical analysis, software engineers empower computers with innovative applications to perform tasks smarter, faster and better. Institute of information Technology (IIT) has launched Bachelor of Science program in software Engineering from the academic year of 2017-18.

Throughout this program, we will provide students with a strong foundation in software engineering using a combination of classroom study, software development experience and design projects. Hence the program blends engineering principles, computing skills, project leadership and software construction to supply students with a comprehensive understanding of the field and to prepare graduates for the workforce or future study.

This program is designed around a set of core courses that introduces the fundamentals of software engineering, followed by a broader range of courses. Students could choose to augment their core with more Software Security-oriented courses (e.g. Software Security and Information Security), Data Science courses (e.g. Data Mining, Big Data and Large-scale Computing), Web Services and Applications oriented courses (e.g. Web programming, User Interface Design and Evaluation), or Graphics and Game related courses (e.g. animation for computer games, Artificial Intelligence for Games). Each of these areas is covered by a dedicated set of core and extended courses. In short, by providing a careful balance between theory and practice, the program will prepare students for central software positions in the software industry, government and institutions where software engineering has become a key activity.

## **Program Objectives**

Information and Communication Technology (ICT) sector being one of the most knowledge-intensive branches of the economy, there is demand for human resource in the software engineering discipline in both public and private sectors. Software engineering is a field that deals with high-level designs and solutions that guide the development of specific software projects or products. The program has been tailor-made to produce graduates who are proficient in developing software according to industry standards in terms of methodologies and

technologies. The course provides students with both theoretical knowledge and practical skills in areas such as software development, integration & testing and software project management. Graduates will possess the engineering skills required to design and implement software systems. The scheme of study offers graduates essential technical and soft skills to seamlessly make the transition from University to the software development industry and adapt to a professional environment.

The program is in line with international recommendations of computing curricula for Undergraduate Degree Programs in Software Engineering and designed in collaboration with software industry. This includes:

- a) Foundation:** Graduates shall have strong foundation in science and mathematics. He can apply this fundamental knowledge in developing software engineering tasks.
- b) Development:** Graduates can effectively apply software engineering practice over the entire system life cycle. This includes requirements engineering, analysis, prototyping, design, risks involved in software and embedded systems.
- c) Process:** Graduates know classical and evolving software engineering methods, can select and tailor appropriate methods for projects and can apply them as both team members and managers to achieve project goals.
- d) Professionalism:** Graduates are knowledgeable of the ethics, professionalism and cultural diversity in the work environment.
- e) Quality:** Graduates can apply basic software quality assurance practices to ensure that software designs, development and maintenance meet or exceed applicable standards.
- f) Presentation:** Graduates have effective written and oral communication skills. Graduates can prepare and publish the necessary documents required throughout the project life cycle. Graduates can effectively contribute to project discussions, presentations and reviews.
- g) Growth:** Graduates understand the need for lifelong learning and can readily adapt to new software engineering environments.

## Program Mission

The primary mission of Bachelor of Science in Software Engineering program is to develop professionals who can define, design, and develop high-quality software systems within resource constraints. We accomplish this mission through our undergraduate and graduate programs in software engineering and the research activities of our faculties working along with their student's research team.

## Program Vision

Graduates of Bachelor of Science in Software Engineering program will be recognized as innovative leaders in the field of computer science and software engineering by their work in software development in a myriad of application areas and through their work in advanced study and research. The faculties will continue to be known for their passion for teaching these students and for their knowledge for their passion for teaching these students and for their knowledge, expertise and innovation in advancing the frontiers of knowledge in computer science and software frontiers of knowledge in computer science and software engineering.

## Faculties

Bachelor of Science in Software Engineering Program was launched under the Institute of Information Technology (IIT). The Institute consists of twelve renowned faculties. They are listed below:

S/N	Name	Designation	Research Areas
1.	Md. Auhidur Rahman	Assistant Professor & Director (Acting)	IoT, Fog, Cloud Computing
2.	Mohammad Nuruzzaman Bhuiyan	Assistant Professor	IoT, Cyber Security, E-commerce
3.	Dipanita Saha	Assistant Professor	Bio Informatics, IoT
4.	Falguni Roy	Assistant Professor	Information Retrieval, Data Mining
5.	Dipok Chandra Das	Assistant Professor	Software Analytics & Metrics
6.	Md. Iftekhar Alam Efat	Assistant Professor	Software Reusability & Architecture, Machine Learning, IoT, Big Data & Data Science
7.	Tasniya Ahmed	Lecturer	N/A
8.	Md. Eusha Kadir	Lecturer	Machine Learning, Software Analytics

S/N	Name	Designation	Research Areas
9	Tasnim Rahman	Lecturer	N/A
10	Nazmun Nahar	Lecturer	Deep Learning, Image processing, Computer Vision, Brain Informatics
11	Rafid Mostafiz	Lecturer	Computer Vision, Deep Learning, Medical Imaging, Artificial Intelligence.
12	Md Hasan Imam	Lecturer	IoT, Cloud Computing, Cryptography

## Students

In three academic sessions of 2017-2018, 2018-2019 and 2019-2020, about 100 (sixty) students were admitted into this program according to merit position, comprising about 35 (thirty five) students in each session. Currently, the students of academic session, 2017-2018, are conducting industry internship spanning over six months, started from March 2022.

## Degree Requirements

In order to qualify for the BSSE degree, a student has to meet the following requirements:

- \* Completion of minimum 144 credits including an internship program.
- \* A minimum of grade C+ in a Comprehensive Examination.
- \* Passing of all courses individually with at least D grade.
- \* Grade Point Average (GPA) of 2.5 or above.

## Course Load

BSSE is full-time course of study and each student must take 18 credits in each semester. Any student failing to take 18 credits in a regular semester will stand withdrawn from the program for that particular semester. An exception to this rule may be made only by the academic committee of IIT. The full-time course load may be relaxed for transfer students or who are enrolling again after withdrawal.

## Break down of a Semester

The BSSE program is a four-year program consisting of eight semesters. Each semester has duration of six months; the break down is presented as follows:

Weeks	Purpose
14 weeks	Scheduled classes
1 Week	Preparation time for examinations
3 weeks	Semester final examination
3 weeks	Result publication
4 weeks	Vacation and holidays
1 week	Supplementary examinations

- \* Less than 75% attendance will be treated as non-collegiate student. A non-collegiate student has to apply to the Director, Regular Program Office to sit for the examination and upon the approval of academic committee, IIT; he/she has to deposit TK. 3000/- (Three Thousand) as fine as per university rules.
- \* Below 60% attendance, a student should not be allowed to sit for the examination as per university rules.

## Unfair Means

Students are strictly forbidden from adopting unfair means. Students who will adopt unfair means will be punished as per rules of Noakhali Science and Technology University.

## Grading System & Definition of a Credit

The credit is defined as follows:

Class Credit	Class Type	Hours/Week
1	Theory	1 hour
1	Laboratory	2 hour

Most of the courses will consist of both theoretical classes and laboratory works.

- \* The total number of credits of a course will be distributed for both theoretical and laboratory works.

## Letter Grade, Grade Points and their Meaning

Grades in each course will be assigned (in according with the rules NSTU/UGC) as mentioned below.

Marks	Letter Grade	Numeric Grade	Comments
Marks $\geq 80\%$	A+	4.00	Excellent
$75\% \leq \text{Marks} < 80\%$	A	3.75	Better
$70\% \leq \text{Marks} < 75\%$	A-	3.50	Good
$65\% \leq \text{Marks} < 70\%$	B+	3.25	Above average
$60\% \leq \text{Marks} < 65\%$	B	3.00	Average
$55\% \leq \text{Marks} < 60\%$	B-	2.75	Below average
$50\% \leq \text{Marks} < 55\%$	C+	2.50	Satisfactory
$45\% \leq \text{Marks} < 50\%$	C	2.25	Not satisfactory
$40\% \leq \text{Marks} < 45\%$	D	2.00	Pass
Marks $< 40\%$	F	0.00	Fail
	I		Incomplete
	W		Withdrawn

## Promotion to the next Semester

- \* The overall CGPA obtained by a student in the previous semester must not be less than 2.5
- \* A student will have to secure at least grade D in each course in the previous semester.
- \* Students who achieved overall CGPA 2.5 but F in any course will have to sit for supplementary exam and he/she will get no more than B+ in that course.
- \* Students failed to get promoted will retake that semester with the following batch.
- \* However, a student may retake only those courses for which he/she got 'F' grade.



## **Comprehensive Examination**

A Comprehensive Examination is taken to evaluate to student's understanding of their major areas of study (Software Engineering courses). Students must earn a minimum grade 'C+' in this examination. The Comprehensive Examination grade is shown on the Grade Sheet but is not included in the calculation of CGPA.

The Comprehensive Examination is usually taken two weeks before the end of the final semester. If a student fails the Comprehensive Examination, he/she may sit for a retake which is allowed only once, unless otherwise decided by the Academic Committee.

## **Internship Program**

To gain the industry experience, students of seventh semester will be assigned with a well-known organization of Information Technology industry. Students, upon completion of 108 credits (36 different courses), will have an acceptable theoretical knowledge. With such background, students will move to industry to implement the knowledge he or she gathered and at the same time to be aware of the industry trend and there working environment. After completion of the internship, students will be back to the institution and have to present a report on their domain of work in the respective organization. Students will also be evaluated form the assigned organization.

## **Applicability of the Curriculum and Rules**

The Institute of Information Technology reserves the right to make, at any time without notice, changes to program, courses, statements contained in this booklet. No responsibility will be borne by Noakhali Science and Technology University or by the Institute of Information Technology (IIT) for any adjustment or expenses resulting from such changes.

## **Final Remarks**

The software industry is always looking for qualified engineers from the Universities. Instead of going with traditional systems, IIT is proposing an industry-oriented program. IIT believes BSSE will work more like a bridge between the software industry and educational institutes.

The courses are designed in such a way that within the first six semesters each student will acquire the knowledge to go to the industry and work. Upon completion of 6 months of internship experiences, the student will come back to the institute for completing the last semester. At the end, a BSSE fresh graduate will be a complete software engineer who can go start working in the industry.

Software Engineering is an important stream of typical computer science, what IIT is planning to address. There are other streams such as database, networking etc. which have acute market demands. The future goal of IIT is set to produce quality practitioners in those streams as well.