

**INSTITUTE OF INFORMATION TECHNOLOGY
UNIVERSITY OF DHAKA**



<http://iit.univdhaka.edu>

**MASTER OF SCIENCE IN SOFTWARE ENGINEERING
(MSSE)**

1. Institute of Information Technology (IIT)

Institute of Information Technology (IIT), University of Dhaka started its journey in June 2001 to create efficient manpower in information technology. IIT currently offers Bachelor of Science in Software Engineering (BSSE), Master of Science in Software Engineering (MSSE), Master in Information Technology (MIT) and Post Graduate Diploma in Information Technology (PGDIT). Apart from its regular activities, it also produces state-of-the-art researches and those are published in world class journals and conferences. Specially, researches are focus towards the different aspects of software engineering for establishing research culture in this extremely potential area.

IIT has a silent ambience and is adjacent to the Dhaka University Science Library. The four-storied red ceramic IIT building contains six software laboratories, one seminar library and two large classrooms. The laboratories and classrooms are air-conditioned and equipped with multimedia, document camera system and Internet facilities.

2. Master of Science in Software Engineering (MSSE)

Software engineering is a systematic and disciplined approach to developing software. It applies computer science, mathematics and business principles and practices to the creation, operation and maintenance of software systems. It is now more than an integrated approach of design, development, QA and maintenance rather than only programming. Therefore it becomes increasingly important that while understanding developing technologies, architectures and their influence on software engineering processes, research for novel methods and methodologies on those very issues. The research is the only sustainable way of meeting the ever increasing global demands.

CNN/Money Magazine (2011) rated software engineering as the number one best job for salary and opportunities [<http://money.cnn.com/magazines/moneymag/bestjobs/>]. Software Engineering graduates get employment as software developers and testers, software architects and designers, team leaders and project managers, and executive-level positions in software development projects. At the same time, the appeal of research and development on new findings gradually creating inroads in this popular market. Even in Bangladesh, world reputed companies like Samsung, LG and many others are opening their research and development centers.

The proposed Master of Science in Software engineering degree will encompass a wide range of activities covering software engineering practice, software architectures, formal design methods, automated verification, computational models and foundations in concord with the traditional computer sciences. Mary Shaw shows in his famous journal on research in software engineering that there are six typical phases in this very new area of research which distinguished software engineering research from other traditional fields like Physics, Chemistry etc. Those are: Basic Research, Concept formulation, Development and extension, Internal Extension and Exploration, External extension, Exploration and Popularization. The aim of this proposed program is to introduce those formal phases to the prospective students, and thus to make them ready for this newest challenge in the industry.

This will be a three semester (one and half year) full time program, where there will be two explicit parts. Half the semester credits will be allocated for theoretical studies to prepare students to do research. The rest will be allocated to do research and formal publications.

This will be an elite degree for those students who have excellent grades and also possess strong communication skills together with an outward worldly focus and personality.

2.1 Eligibility and Admission

- The seats for MSSE program are limited.
- Candidates having good grades and have completed their undergraduate degree from IIT through Bachelor of Science in Software Engineering (BSSE) (internal candidates), shall get admission to the Master of Science in Software Engineering (MSSE) automatically.

All the prospective candidates must sit for an admission test conducted by the IIT authority, and IIT shall have the ultimate authority to select students from that test subject to availability of seats.

2.2 Rules and Regulations

2.2.1 Degree Requirements

- The minimum duration of the MSSE course shall normally be three semesters. A candidate for the Master's degree must complete all the requirements for the degree within three academic years (session) from the date of the first admission in the respective program.
- For the degree of MSSE a student must earn a minimum of 36 credit hours including a thesis for which 18 credit hours shall be assigned.
- Since this is a regular program, all the students shall be considered as regular students and shall be expected to finish within the stipulated time of three semesters.
- According to the rule of the University of Dhaka, the registration of a Masters student is valid for three years. This rule imposes the constraints of finishing the degree within the registration period. In case of failure of finishing the degree within the registration period shall force the student to drop out.
- Regular students must enroll for 12 credit hours per semester.

2.2.2 Course Load for MSSE Students

Academic progress shall be measured in terms of credit hours earned by a student. One credit hour subject shall normally require one hour of class attendance per week for one semester; while one credit hour of thesis/project should normally require two hours of work per week for one semester including guided and unguided supervision; also one credit hour of laboratory should normally require two hours of work per week for one semester. The number of credit hours for each subject shall be as specified in the syllabus.

2.2.3 Breakdown of a Semester

The Master of Science in Software Engineering (MSSE) degree program in the Institute of Information Technology, University of Dhaka is an one and half year program consisting of **three semesters** having duration of **six months each**, and consists of:

Weeks	Purpose
15 weeks	For holding classes
1 week	Preparation time for examinations
3 weeks	Semester final examination
3 weeks	Result publication
4 weeks	Vacation and holidays

2.2.4 Class Attendance for Final Exam Appearance

- Less than 75% attendance will be treated as non-collegiate student. A non-collegiate student has to apply to the chairman, BIT Program Office to sit for the examination and upon the approval of academic committee, IIT; he/she has to deposit TK. 5000/- (Five 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.
- Supplementary examination fee per course is TK. 2000/-

2.2.5 Unfair Means

Students are strictly forbidden from adopting unfair means. Students who will adopt unfair means will be punished as per rules of University of Dhaka.

2.3 Grading System

2.3.1 Definition of a Credit

The Credit is defined as follows:

- 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 classes and laboratory works as follows:

Class	Hours/week
1 Credit Theory	1
1 Credit Laboratory	2

2.3.2 Letter Grade, Grade Points and their Meaning

Grades in each course will be assigned (in accordance with the rules of Faculty of Science, DU/UGC) as mentioned below:

Marks	Letter Grade	Numeric Grade	Comments
80% or above	A+	4.00	Excellent
>=75 but < 80%	A	3.75	Better
>=70 but < 75%	A-	3.50	Good
>=65% but < 70%	B+	3.25	Above average
>=60% but < 65%	B	3.00	Average
>=55% but < 60%	B-	2.75	Below average
>=50% but < 55%	C+	2.50	Satisfactory
>=45% but < 50%	C	2.25	Not satisfactory
>=40% but < 45%	D	2.00	Pass
Less than 40%	F	0.00	Fail
	I		Incomplete
	W		Withdrawn

2.3.3 Letter Grade, Grade Points and their Meaning

Grades in each course will be assigned (in accordance with the rules of Faculty of Science, DU) as mentioned in Table 7.

The GPA (Grade Point Average) and CGPA (Cumulative Grade Point Average) will be calculated as follows:

$$\text{GPA or CGPA} = \frac{\text{Grade Points in a Course X credits for that course}}{\text{Total Credits taken}}$$

2.3.4 Assessment and Evaluation

Except the thesis, the total performance of a student in a given course will be based on continuous assessment and course final examinations. Marks distribution will be as follows:

Continuous Assessment **50% of total marks**

Course Final Examinations **50% of total marks**

The continuous assessment may consist of class tests, attendance, seminars/presentations/viva-voce, assignments, completion of projects, and mid-term examinations. The mentioned criteria to assess a student will be justified by individual course teacher and he/she may set his own assessment criteria **except final examinations**.

Assessment of Thesis Course:

All the students have to submit a thesis book at the end of their third semester. The thesis will be evaluated by two examiners: two experts of the area of research (experts can be selected from IIT or from outside of the IIT selected by the supervisor of that thesis). The evaluation of the thesis will be as follows:

Continuous Evaluation	20
Supervision	25
External	25
Defense	20
Publication	10

After having experts' evaluation report, a student may have to revise his/her thesis and resubmit the thesis. In case of having a fail grade, a student has to retake the whole 18 credits of thesis.

After completion of writing the thesis, with the consent of the supervisor, a student may apply for his/her thesis defense. The supervisor will arrange a rigorous thesis presentation at the seminar room (open to all) and then arrange an interview session with the MSSE exam committee of IIT and some experts on that area of research.

2.3.5 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 sit for a supplementary exam and he/she will get no more than **B+** in that course.
- Students fail 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.

3 MSSE Curriculum

3.1 Course Structure

In order to understand the program structure, the semester wise credit distribution is shown below. To address individual subjects, we have adopted the following course prefixes.

Semester 1

Course Code	Course Title	Credit	Theory	Lab
MS1001	Research Methodology	3	2	1
MS1002	Formal methods and Models in Software Engineering	3	2	1
MS1003	Secure Software Design and Programming	3	2	1
MS1004	Distributed Software Engineering	3	2	1
4 Courses		12	8	4

Semester 2

Course Code	Course Title	Credit	Theory	Lab
MS1XXX	Elective 1	3	2	1
MS1XXX	Elective 2	3	2	1
MS1007	*Thesis	6	-	-
3 Courses		12	13	5

Semester 3

Course Code	Course Title	Credit	Theory	Lab
MS1007	*Thesis	12	-	-
1 Course		12	-	-

* Thesis (MS1007) shall be considered as a single course of 18 credits, however spanned over 2nd and 3rd Semester. The evaluation of this course will be done at the end of 3rd semester.

3.2 Elective Courses

The elective courses enrich students' knowledge regarding advanced studies and research. More promising course might be included here based on demand and the availability of the resource personnel.

Number	Course Code	Course Name
8	MS1008	User Interface design and development
9	MS1009	Reusable software architecture
10	MS1010	Quality of services for software architectures
11	MS1011	Information security theory and practices
12	MS1012	Software engineering and security architecture
13	MS1013	Security risk analysis and management
14	MS1014	Software engineering economics
15	MS1015	Software project management
16	MS1016	Cloud computing
17	MS1017	Wireless mesh networks
18	MS1018	Mobile and wireless security
19	MS1019	Embedded systems
20	MS1020	Distributed databases
21	MS1021	Data warehousing and mining
22	MS1022	Artificial Intelligence and Machine learning

23	MS1023	Bio-informatics and systems biology
24	MS1024	Computer graphics and image processing
25	MS1025	Game theory
26	MS1026	Simulation and modeling
27	MS1027	Probability and stochastic process
28	MS1028	Algorithm and optimization

3.3 Program Fee Structure

Since this will be the regular MS program offered within the jurisdiction of The University of Dhaka, the program fee structure will be as per university rule. However, if any additional costs should incur, IIT holds the right to charge those extra fees with prior permission from the Academic Committee of IIT.

4 Final Remarks

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 researchers in those streams as well.

IIT authority will resolve any other points not mentioned in this document.