

**Guideline for preparing standard curriculum  
of  
Four Years Bachelor Degree in Engineering**

Submitted by

Standard syllabus guideline making committee



## 1. Introduction

An engineering program must be carefully crafted to prepare engineering students for immediate entry into the workplace or to pursue advanced graduate study. Much of our youth future success depends on the quality of the education they receive. Therefore, the demands for quality standards in higher education are increasing. To ensure that an academic program is meeting certain standards necessary to produce graduates who are ready to enter their professions, UGC has decided to prepare curriculum guidelines. Curriculum needs to be aligned with national and international professional association.

Department offering a four years' bachelor program in engineering should have Educational Objectives based on the mission of the department and the perceived needs of the stakeholders. The mission statement should have a preamble followed by declarations of four interconnected commitments: to students, to faculty, to alumni, and to the industries. The program must have documented student outcomes. Attainment of these outcomes prepares graduates to enter the professional practice of engineering. The curriculum should support some attainments of the following student outcomes:

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- (d) an ability to function on multidisciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- U) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Program outcomes are outcomes (a) through (k) plus any additional outcomes that may be articulated by the program. Program outcomes must foster attainment of program educational objectives. There must be an assessment and evaluation process that periodically documents and demonstrates the degree to which the program outcomes are attained.

To prepare students to meet their career objectives, engineering curriculum is suggested to be composed of the following categories of courses:

- (i) Language
- (ii) General Education
- (iii) Basic Sciences
- (iv) Mathematics
- (v) Interdisciplinary
- (vi) Program Core and
- (vii) Technical Electives .

## **2. Definition of a Credit Hour and Minimum Credit Hour Requirement**

### **Bi-semester Credit Hour**

UGC has decided to consider the definition of credit hour widely accepted in order to determine the minimum credit hours required for awarding the degree.

In general, the length of a bi-semester shall consist of no fewer than 15 calendar weeks and no more than 17 calendar weeks of instructional time . The "credit hour" (one credit hour) is defined as "the amount of work represented in intended learning outcomes and verified by evidence of student achievement, that is, an institutionally established equivalency that reasonably approximates not less than:

1. one hour of classroom or direct faculty instructions (so-called contact hour) and a minimum of two hours of out-of-class student work (homework, assignment, etc.) each week for approximately fifteen weeks for one semester; or
2. at least an equivalent amount of work as required in paragraph ( 1) of this definition for other academic activities as established by the institution, including laboratory work, internships, practical work, studio work, and other academic work leading to the award of credit hours.

It is important to note that there is no requirement that a credit hour exactly duplicates the amount of work in paragraph ( 1) as is highlighted in the provisions of paragraph (2). The requirement is that a credit hour reasonably approximates that minimum amount of work in paragraph (1).

### Lecture Classes

One semester credit hour will be awarded for a minimum of  $1 \times 60 \times 15 = 900$  minutes of formalized instruction (contact hour) that typically requires students to work at out-of-class assignments an average of twice the amount of time ( 1,800 minutes) as the amount of formalized instruction. It is acknowledged that formalized instruction may take place in a variety of modes .



### Laboratory Classes

For a laboratory class, the hours per week are considered to be all in class with no outside assignments. Thus, one unit (or one credit) is two hours (120 minutes) per week of laboratory time which amounts to 1800 minutes in 15 weeks.

### Conversion Rule

X= no of weeks

Y = no of minutes of classroom (or contact hour) per lecture

Multiplication factor

$$M = (60 * 15) / (X * Y)$$

Example:

For 14 weeks semester system

X = 14 weeks and Y = 50 minutes,

$$M = 60 * 15 / (50 * 14) = 1.2857$$

### **2.1. Minimum Credit Hour Requirement for awarding degree**

A. For 15-17 weeks' bi-semester and one hour of classroom or direct faculty instruction:

15 credit hours per semester (internationally accepted credit-hours) x 2 semesters per year

= 30 credit hours per year.

For 4 years (8 semesters)

$$30 \text{ credit hour per year} \times 4 \text{ years} = 120 \text{ credit hours}$$

**AI.** For 14 weeks' bi-semester and 50 minutes of classroom or direct faculty instruction:

Many public universities in Bangladesh have adopted bi-semester system of 14 weeks (less than 15 weeks) and 50 minutes of the classroom lecture. The minimum total credit hours' requirement is 154 credit hours.

Credit hours required:

$$\text{Multiplying factor, } M = 60 * 15 / (50 * 14) = 1.2857$$

$$\text{Credit hours required} = 120 * M \therefore 154 \text{ credit hours}$$



### 3. University Grading Standards

UGC recommends internationally accepted grading system Grade Quality

Points		Quality of Performance
A	4.0	Excellent
B	3.0	Good
C	2.0	Satisfactory
D	1.0	Passing
F	0.0	Failure

An institution may adopt the further division of letter grade viz B+, B-, C+, C-, D+, etc. The institution will determine minimum average cumulative grade point (CGPA) (:::: C) required for awarding the degree.

### 4. Course Exemption/Credit Transfer

If a student completed a graduate level course from another university , his/her present university may accept the credit he/she earned for the course. But each university must have well defined credit transfer policy.

### 5. Part-time Student

For the bi-semester system, part-time student may enroll maximum 12 credit-hours per semester.

