Faridpur Engineering College

Syllabus For
Department of Civil Engineering

Faculty of Engineering and Technology

University of Dhaka

RULES AND REGULATIONS FOR UNDERGRADUATE
PROGRAMME UNDER COURSE SYSTEM

3.1 Introduction

From the academic session 2008-09,Faridpur Engineering College is following a course system for undergraduate studies. Given below an extract from the report of the committee for framing recommendations for implementation and administration of course system of instruction at undergraduate level as approved in the meetings of the academic Council held on September 24 and 30, 1992, and October 4 and 19, 1992. Only relevant sections of the report and the amendments that were subsequently made to it are included so that the students can have a clear understanding about Course System. The rules and regulations administering undergraduate curricula through Course System began applicable for students admitted to Faridpur Engineering College in First Year classes and subsequent sessions.

3.1.1 The Course System

The undergraduate curriculum at Faridpur Engineering College is based on the course system. The salient features of the course system are;

i. Reduction of the number of theoretical courses and examination papers around five in each term,
ii. The absence of a pass or a fail on an annual basis,
iii. Continuous evaluation of student's performance,
iv. Introduction of Letter Grades and Grade Points instead of numerical grades ,
v. Introduction of some additional optional courses and thus enable students to select courses according to his/her interest as far as possible,
vi. Opportunity for students to choose fewer or more courses that the normal course load depending on his/her capabilities and needs,
vii. Flexibility to allow the student to progress at his/her own pace depending on his/her ability or convenience, subject to the regulations on credit and minimum grade point average (GPA) requirements, and
viii. Promotion of teacher-student contact.

In the curriculum for the undergraduate programmes, besides the professional courses pertaining to each discipline, there is a storing emphasis on acquiring a through knowledge in the basic science of Mathematics, Physics and Chemistry. Due importance is also given for the study of several subjects in Humanities and Social Sciences which, it is expected will help the student to interact more positively with the society in which he/she/lives. Thus the course contents of the undergraduate programmes provide a harmonious blend of both basic sciences and their applications as well as their social relevance.

The first two terms of bachelor's degree programmes consist of courses in basic sciences, mathematics, humanities and social sciences, basic engineering and architecture subjects. The third and subsequent terms build directly on the knowledge of the basic subjects gained in the first two terms and go on to develop competence in specific disciplines.

3.2 Students Admission

Students will be admitted in undergraduate curricula in the Departments of Civil Engineering, Computer and Communication Engineering, Electrical and Electronic Engineering as per rules of the Faridpur Engineering College. The Registrar's Office serves Admissions Office and deals with course registration in addition to student admission.

3.3 Number of Semester in a Year

There will be two Semesters (Semester I and Semester II) in an academic year. In addition to these two regular Semester there may be a Short Term in the intervening period between and of Semester II and commencement of Semester I. During this term students, those who need, may take additional courses either to make up deficiencies in credit and GPA requirements or to fulfill the credit requirements for bachelor's degree spending less time than the normal duration; and other students may take vacation.

3.3.1 Duration of Semester

The duration of each of Semester I and Semester II will be 18 weeks which will be used as follows:

Classes	14 weeks
Recess before Term Final Examination	02 weeks
Total =	16 Weeks

The duration of a Short Term will be around 8 weeks of which about 7 weeks will be spent for class lectures and one week for Term Final Examination.

3.4 Course Pattern and Credit Structure

The entire undergraduate programme is covered through a set of theoretical and laboratory/sessional/studio courses.

3.4.1 Course Designation and Numbering System

Each course is designated by a two to four letter word identifying the department, which offers it followed by a three digit number with the following criteria:

(a) The first digit will correspond to the year/level in which the course is normally taken by the students.

(b) The second digit will be reserved for departmental use for such things as to identify different areas within a department.

(c) The last digit will usually be odd for theoretical and even for laboratory or sessional courses.

The course designation system is illustrated by two examples.

3.4.2 Assignment of Credits

(a) Theoretical Courses:
One lecture per week per term will be equivalent to one credit.

(b) Laboratory/sessional/Design:
Credits for laboratory/sessional or design courses will be half of the class hours per week per term.

Credits are also assigned to project and thesis work taken by students. The amount of credits assigned to such work may vary from discipline to discipline.

The curriculum does not demand the same rate of academic progress from all students for obtaining the degree but only lays down the pace expected of a normal student. A student whose background or capacity for assimilation is lower will be permitted to complete the programme at a slower pace by studying a lesser number of courses during a given term (subject to a minimum course load). He may keep pace with his class by taking during the Short Term those courses which he had dropped during the Regular Terms, or by covering the entire degree programme over an extended period without developing any felling of inferiority complex. .

3.5 Types of Course

The courses included in undergraduate curricula are divided into several groups as follows:

3.5.1 Core Courses
In each discipline a number of courses will be identified as core courses which form the nucleus of the respective bachelor's degree programme. A student has to complete all of the designated core courses for his/her discipline.

3.5.2 Pre-requisite Courses
Some of the core courses are identified as pre-requisite courses. A pre-requisite course is one which is required to be completed before some other course(s) can be taken. Any such course, on which one or more subsequent courses build up, may be offered in each of the two regular Terms.

3.5.3 Optional Courses
Apart from the core courses, students will have to complete a number of courses which are optional in nature in that students will have some choice to choose the required number of courses from a specified group/number of courses.

3.6 Course Offering and Instruction
The courses to be offered in a particular term will be announced and published in the Course Catalog along with a tentative Term Schedule before the end of the previous term. Whether a course is to be offered in any term will be decided by the respective Board of Undergraduate Studies (BUGS). Respective departments may arrange to offer one or more pre-requisite or core courses in any term depending on the number of students who dropped or failed the course in the previous term.

Each course is conducted by a teacher. The course teacher is responsible for maintaining the expected standard of the course and for the assessment of student's performance. Depending on the strength of registered students (i.e. the number of students) enrolled for the course, the teacher concerned might have course associates and teaching assistants (TA) to help him/her in teaching and assessment.

For a course strength necessitating two or more parallel classes or sections, one of the course teachers or any other member of the teaching staff of the department may be designated as course coordinator. He/She has the full responsibility for coordinating the work of the other members of the department involving in that course.

3.7 Departmental Monitoring Committee
Consistent with its resilient policy to keep pace with new developments in the field of science and technology, the university will update its course curriculum at frequent intervals (at least every three years). Such updating aims not only to include the expanding frontiers of knowledge in the various fields but also to accommodate the changing social, industrial and professional need of the country. This can be done through deletion and modification of some of the courses and also through the introduction of new ones.

BUGS of each department will constitute a Departmental Monitoring Committee with three teachers of the department. This committee will monitor and evaluate the performance of the Course System within the department. In addition to other teachers of the department, the committee may also propose from time to time to the BUGS any changes and modifications needed for upgrading the Undergraduate Curriculum and the Course System.

3.8 Teacher Student Contact]
The proposed system encourages students to come in close contact with teachers. For promotion of teacher-student contact, each students is assigned to an Adviser and the student is free to discuss with his/her adviser all academic matters, especially those related to courses taken and classes being attended

by him/her. Students are also encouraged to meet with other teachers any time for help on academic matters.

3.9 Student Adviser

One Adviser would normally be appointed for a bath of students by the BUGS of the concerned departments(s) who will advise each student on the courses to be taken by a student. Adviser will discuss with the student his/her academic programme and then decide the number and nature of courses for which he/she register/however, it is the student's responsibility to keep contact with his/her adviser who will review and check on subsequent progress. The adviser should be in the rank of an Assistant Professor or above from the concerned department(s).

For a student of second and subsequent terms, the number and nature of courses for which he/she can register will be decided on the basis of his/her academic performance during the previous term. The adviser will advise the students to register for the courses during the next term within the framework of the guidelines with respect to minimum/maximum credit hour limits, etc. Which are elaborated at appropriate places in this booklet. He/ She is also authorized to permit the student to drop one or more courses based on his/her academic performance and the corresponding categorization (Art.3.16).

Special provisions exist for academically weak students with regard to make-up courses (Art.3.19).

3.10 Registration Requirements

Any student who makes use of classroom or laboratory facilities or faculty time is required to register formally. Being admitted to the university, each student is assigned to a student adviser. The students can register for courses he/she intends to make during a given term only on the basis of the advise and consent of his/her adviser.

3.10.1 Registration Procedure

Students must register for each class in which they will participate. Each student will fill up his/her Course Registration Form in consolation with and under the guidance of his/her adviser. The original copy of the Course Registration Form will be submitted to the Registrar's Office, and then the requisite number of photocopies will be made by the Registrar's Office for distribution. The date, time and venue will be announced in advance by the Registrar's Office. Much counseling and advising are accomplished at registration time. It is absolutely necessary that all students present themselves at the registration desk at the specified time.

3.10.2 Limits on the Credit Hours to be Taken

A students must be enrolled in at least 15 credit hours. He/ She may be allowed to enroll in up to a maximum of 24 credit hours if recommended by his/her Adviser. A student must enroll for the prescribed sessional/laboratory courses in the respective Term within the allowed credit hour limits.

In special cases where a student cannot be allotted the minimum required 15 credit hours in a Term, the relevant BUGS may approve a lesser number of credit hours to suit individual requirements. Such cases shall only be applicable to students needing less than 15 credits for graduation

3.10.3 Pre-condition for Registration

A student will be allowed to register in those courses subject to the capacity constrains and satisfaction of pre-requisite courses. If a student fails in a pre-requisite course in any Term, the concerned BUGS may allow him/her to register for a course which builds on the pre-requisite course provided his/her attendance and grades in continuous assessment in the said pre-requisite course is found to be satisfactory.

Registration will be done at the beginning of each term. The Registration programme with dates and venue will be announced in advance. Late registration is, however, permitted during the first week on payment of a late registration fee. Students having outstanding dues to university or a hall of residence shall not be permitted to register. All students have, therefore, to clear their dues and get a clearance or no dues certificate, On the production of which, they will be given necessary Course Registration Forms and complete the course registration procedure. Registration Forms will normally be available in the Register's Office. However, for the First Year students, prior department-wise ennoblement/admission is mandatory. An orientation programme will be conducted for them at the beginning of the first term when they will be handed over the registration package on production enrollment slip/proof of admission.

3.10.4 Pre registration

Pre-registration for courses to be offered by the students in a particular term will be done on specified dates before the end of the previous term. All students in consolation with their course advisers are required to complete the pre-registration formalities, failing which a fine of Tk. xxxx (amount may be decided by the authority) will have to be paid before registration in the next term. Further a student who does not pre-register may not get the courses desired by his/her subsequently.

3.10.5 Registration Deadline

Student must register for the courses to be taken before the commencement of each term and no late registration will be accepted after one week of classes. Late registration after this date will not be accepted unless the student submits a written appeal to the Registrar through the concerned Head and can document extenuating circumstances such as medical problems (physically incapacitated and not able to be presented) from the Chief Medical Officer of the University or some other academic commitments which precluded enrolling prior to the last date of registration.

3.10.6 Penalty for Late Registration

Students who fail to register during the designated dates for registration are charged a late registration fee of Tk. xx.xx (amount may be decided by the authority). This extra fee will not be waived whatever be the reason for late registration.

3.10.7 Course Adjustment Procedure

A student will have some limited options to add or delete courses from his/her registration list, within the first two weeks from the beginning of the term. He/ She may add courses only within the first two weeks of a regular Term and only the first week of a short Term. In case of dropping a course a student will be allowed to do so within four weeks after the commencement of a regular Term and two weeks after the commencement of a short Term. Adjustment of initially registered courses in any Term can be done by duly completing the Course Adjustment Form. These forms will normally be available in the Registrar's Office. For freshman students such forms can be included in the registration packet at the of orientation.

Any student willing to add or drop courses will have to fill up a Course Adjustment Form in consultation with under the guidance of his/her adviser. The original copy of the Course Adjustment Form will be submitted to the Registrar's Office, and then the requisite number of photo copies will be made by the Registrar's Office for distribution to the concerned Adviser, Head, Dean, Controller of Examination and the students.

All changes in courses must be approved by the Adviser and the Head of the department concerned. The Course Adjustment Form will have to be submitted to the Registrar's Office after duly filled in the signed by the concerned persons. To add/drop a course, respective teacher's consent will be required.

3.10.8 Withdrawal from a Term

If a student is unable to complete the Term Final Examination due to serious illness or serious accident, he/ She may apply to the Head of the degree awarding department for total withdrawal from the Term within a week after the end of the Term Final Examination. However, he/she may choose not to withdraw any laboratory/sessional/design course if the grade obtained in such a course is 'D' or better. The application must be supported by a medical certificate from the Chief Medical Officer of the University. The Academic Council will take the final decision about such application.

3.11 Grading System

The total performance of a student in a given course is based on a scheme of continuous assessment. For theory courses this continuous assessment is made through a set of quizzes/in class evaluation, class participation, homework assignments, and a term final examination. The assessment in laboratory/sessional courses is made through observation of the student at work in class, viva-voce during laboratory hours, and quizzes. For architecture students, assessments in design sessional would be done through evaluation of a number of projects assigned throughout the term. As discussed earlier, each course has a certain number of credits, which describe its weight age. A letter grade with a specified number of grade points is awarded in each course for which a student is registered. A student's performance is satisfactorily and weighted average of the grade points that he/she has maintained. A minimum grade point average is required to be maintained for satisfactory progress. Also a minimum number of earned credits should be acquired in order to qualify for the degree as prescribed under article 3.22.

Letter grades and corresponding grade points will be awarded in accordance with provisions shown below:

Numerical Grade	**Letter Grade**	**Grade Point**
80% or above	A+ (A plus)	4.00
75% to less than 80%	A (A regular)	3.75
70% to less than 75%	A- (A minus)	3.50
65% to less than 70%	B+ (B plus)	3.25
60% to less than 65%	B (B regular)	3.00
55% to less than 60%	B- (B minus)	2.75
50% to less than 55%	C+ (C plus)	2.50
45% to less than 50%	C (C regular)	2.25
40% to less than 45%	D	2.00
Less than 40%	F	0.00
Continuation (For project & thesis/design course)	×	-

3.11.1 Distribution or Marks

Thirty percent (30%) of marks shall be allotted for continuous assessment i.e., quizzes and homework assignments, in class evaluation and class participation. The remainder of the marks will be allotted to Term Final examination which will be conducted centrally by the University. There will be internal and external examiners for each course in the Term Final examination of 3 hours duration. The distribution of marks for a given course will be as follows:

i.	Class participation	10%
ii.	Homework Assignment and Quizzes	20%
iii.	Final Examination (3 hours)	70%
	Total	=100%

Basis for awarding marks for class participation and attendance will be as follows:

Attendance	Marks
90% and above	10
85% to less than 90%	9
80% to less than 85%	8
75% to less than 80%	7
70% to less than 75%	6
65% to less than 70%	5
60% to less than 65%	4
Less than 60%	0

The number of quizzes of a course shall be at lest n+1, where n is the number of credits of the course. Evaluation of the performance in quizzes will be on the basis of the best n quizzes. The scheme of continuous assessment that a teacher proposes to follow for a course will be announced on the first day of classes.

3.12 Earned Credits :

The courses in which a student has obtained 'D' or a higher Grade will be counted as credits earned by him/her. Any course in which a student has obtained 'F' grade will not be counted towards his/her earned credits.

A student who obtains 'F' grade in a Core Course in any term will have to repeat the course.
If a student obtain 'F' grade in an Optional Course he/she may choose to repeat the Course or take a Substitute Course if available.

'F' grades will not be counted for GPA calculation but will stay permanently on the Grade Sheet and Transcript. When a student repeat a course in which he/she previously obtained 'F' grade, he/she will not be eligible to get a grade better than 'B' in such a course.

If a student obtains a grade lower than 'B' in a course, he/she will be allowed to repeat the course only once for the purpose of grade improvement by forgoing his/her earlier grade, but he/she will not be eligible to get a grade better than 'B' in such a course. A student will be permitted to repeat for grade improvement purposes a maximum of four courses in B.Sc Engg and BURP programmes and a maximum of five courses in B Arch programme.

If a student obtains 'B' or a better grade in any course, he/she will not be allowed to repeat the course for the purpose of grade improvement.

3.13 Honours
Candidates for Bachelor's degree in engineering and architecture will be awarded the degree with honours if their over all GPA is 3.75 or better.

3.13.1 Dean's List
As a recognition of excellent performance, the names of students obtaining a cumulative GPA of 3.75 or above in two regular Terms in each academic year may be published in the Dean's List in each faculty. Students who have received F grade in any course during any of the two regular Terms will not be considered for Dean's List in that year.

3.14 Calculation of GPA

Grade Point Average (GPA) is the weighted average of the grade points obtained in all the courses passed/completed by a student. For example, if a student passes/completes five courses in a semester having credits of C_1, C_2, C_3, C_4 and C_5 and his/her grade points in these courses are G_1, G_2, G_3, G_4 and G_5, respectively then.

$$GPA = \frac{\sum CiGi}{\sum Ci}$$

3.14.1 A Numerical Example

Suppose a student has completed five courses in a Term and obtained the following grades:

Course	Credits	Grade	Grade points
EEE 203	3	A +	4.00
EEE 205	3	B	3.00
EEE 207	3	A	3.75
Math 205	2	B +	3.25
Hum	1	A -	3.50

Then his/her GPA for the term will be computed as follows:

$$GPA = \frac{3\times4.0+3\times3.0+3\times3.75+2\times3.25+1\times3.5}{3+3+3+2+1} = 3.52$$

3.15 Student Classification

For a number of reasons it is necessary to have a definite system by which to classify students as First Year/Freshman, Second Year/Sophomore, Third Year/Junior and Fourth Year/Senior. At BUET, regular students are classified according to the number of credit hours earned towards a degree. The following classification applies to the students.

C **Year/ Level**	**Earned Credit Hours**	
	Engineering/URP	**Architecture**
First Year (Freshman) Level I	0 to 36	0 to 34
Second Year (Sophomore) Level II	37 to 72	>34 to 72
Third Year (Junior Level III	73 to 108	>72 to 110
Fourth year (Senior) Level IV	109 and above	>110 to 147
Fifth Year Level V		>147

3.16 Registration for the Second and Subsequent Terms

A student is normally required to earn at least 15 credits in a Term. At the end of each term, the students will be classified into the following three categories:

Category 1 : Consisting of students who have passed all the courses prescribed for the term and have no backlog of courses. A student belonging to Category 1 will be eligible to register for all courses prescribed for the next term.

Category 2 : Consisting of students who have earned at least 15 credits in the term but do not belong to category 1. A student belonging to Category 2 is advised to take at least one course less in the next term subject to the condition that he/she has to register for such backlog courses as may be prescribed by the adviser.

Category 3 : Consisting of students who have earn 15 credits in the term. A students belonging to Category 3 is advised to take at least two courses less subject to registration for a minimum of 15 credits. However he/she will be required to register for such backlog courses as may be prescribed by the adviser.

3.17 Performance Evaluation

The performance of a student will be evaluated in terms of two indices, viz. Term grade point average, and cumulative grade point average, which is the grade average for all the terms. The term grade point average, which is the grade average for all the terms. The term grade point average is computed dividing the total grade points earned in a term by the number of term hours taken in that term. The overall or cumulative grade point average (CGPA) is computed by dividing the total grade points accumulated up to date by the total credit hours earned. Thus a student who was earned 275 grade points in attempting 100 credit hours of courses would have a cumulative grade point average of 2.75.

Students will be considered to be making normal progress toward a degree if their cumulative or overall GPA for all work attempted is 2.20 or more. Students who regularly maintain Term GPA of 2.20 or better are making good progress toward their degrees and are in good standing with the university. Students who fail to maintain this minimum rate of progress will not be in good standing. This can happen when one or more of the following conditions exist:
This can happen when one or more of the following conditions exist:

i) Term GPA falls below 2.20,
ii) Cumulative GPA falls below 2.20,
iii) Earned credits fall below 15 times the number of Terms attended/studied.

All such students can make up deficiencies in GPA and credit requirements by completing courses in next terms (s) and backlog courses, if there be any, with better grades. When GPA and credit requirements are achieved, the student is returned to good standing.

3.18 Academic Progress, Probation and Suspension

Academic Progress: Undergraduate students will be considered to be making normal progress toward a degree if their cumulative or overall GPA for all work attempted is not less than 2.20.

Probation and Suspension: Undergraduate students who regularly maintain Term GPA of 2.20 or better are making good progress toward their degrees and are in good standing with the university. Students who fail to maintain this minimum rate of progress may be placed on academic probation.

The status of academic probation is reminder/warning to the student that satisfactory progress towards graduation is not being made. A student may be placed on academic probation when either of the following conditions exists:

i) The Term GPA falls below 2.20, or
ii) The cumulative GPA falls below 2.20.

Students on probation are subject to such restrictions with respect to courses and extracurricular activates as may be imposed by the respective Dean of faculty.

The minimum period of probation is one Term, but the usual period is for one academic year. This allows the student an opportunity to improve the GPA through the completion of additional course work during the period that the student is on probation. The probation is extended for additional terms until the student achieves an overall GPA of 2.20 or better. When that condition is achieved, the student is returned to good standing.

Academic probation is not to be taken lightly-it is very serious matter. A student on academic probation who fails to maintain a GPA of at least 2.20 during two consecutive academic years may be suspended from this university. A student who has been suspended may make a petition to the Dean of faculty, but this petition will not be considered until the student has been suspended at least one full Term.

Petitions for reinstatement must set forth clearly the reasons for the previous unsatisfactory academic record and it must delineate the new conditions that have been created to prevent the recurrence of such work. Each such petition is considered individually on its own merits.

After consideration of the petition, and perhaps after consultation with the student, the Dean in some cases, reinstate the student if this is the first suspension. However, a second suspension will be regarded as final and absolute.

3.19 Measures for Helping Academically Weak Students

The following provisions will be made as far as possible to help academically weak students to enable them to complete their studies within the maximum period of seven years in engineering and eight years in architecture student, respectively:

i) All such students whose cumulative grade point average (CGPA) is less than 2.20 at the end of term may be given a load of not exceeding four courses, in the next term.

ii) For other academic deficiencies, some basic and core courses may be offered during the Short Term in order to enable the student to partially make-up for the deduced load during Regular Terms.

Following criteria will be followed for determining academically weak students:

i) CGPA falling below 2.20.

ii) Term grade point average (TGPA) falling below 2.20 points below that of previous term.

iii) Earned credit falling below 15 times the number of terms attended.

3.20 Special Courses

a) These courses, which include self-study courses, will be from amongst the regular theory courses listed in the course catalog, a special course can be run only the exceptional cases.

b) Whether a course is to be floated as a special course will be decided by the Head of the concerned department in consultation with the teacher/course coordinator concerned. Decision to float a course as a special course shall be reported to the Academic Council.

c) The special course may be offered to any student in his/her last term if it helps him/her to graduate in that term. It will be offered only if the course is not running in that term as a regular course.

d) Normally no lecture will be delivered for the special course but laboratory/design classes may be held if they form a part of the course. The course coordinator/course teacher will

also assign homework's; administer quizzes and final examination for giving his or her assessments at the end of the term.

e) A student will be allowed to register for a maximum of two courses on self study basis.

f) A special Course shall not be utilized for grade improvement purposes.

3.21 Rules for Courses offered in a Short Term

a) The courses to be run during the Short Term shall be decided on the recommendations of the Departments on the basis of essential deficiencies to be made up by allowed to register in those courses subject to the capacity constrains and satisfaction of pre-requisites.

b) Students will be allowed to register in a maximum of two courses during the Short Term.

c) A course may be given a weight age up to 6 credits in any Short Term following a graduating/final Term if he/she is short by a maximum of 6 earned credits only, on a self-study basis with no formal instruction. In a self-study course, there will be a Final Examination, besides the continuous assessment.

d) A fee of Tk. XX.XX for each credit hour to be registered is to be borne by the students who enroll during Short Term.

3.22 Minimum Earned Credit and GPA Requirements for Obtaining Graduation

Minimum credit hour requirements for the award of bachelor's degree in engineering and architecture will be decided by the respective BUGS. However, at least 157 credit hours for engineering and 190 credit hours for architecture must be earned to be eligible for graduation, and this must include the specified core courses.

The minimum GPA requirement for obtaining a bachelor's degree in engineering, URP or architecture is 2.20.

Completion of fulltime Studentship: Students who have completed minimum credit requirement for graduation for a Bachelors degree shall not be considered and registered as fulltime students.

A student may take additional courses with the consent of his/her adviser in order to raise GPA, but he/she may take a maximum of 15 such additional credits in engineering and URP and 18 such additional credits in architecture beyond respective credit-hour requirements for bachelor's degree during his/her entire period of study.

3.22.1 Application for Graduation and Award of Degree

A student who has fulfilled all the academic requirements for Bachelor's degree will have to apply to the Controller of Examinations through his/her Adviser for graduation. Provisional degree will be awarded on completion of credit and GPA requirements. Such provisional degrees will be confirmed by the Academic Council.

3.23 Industrial/Professional Training Requirements

Depending on each department's own requirement a student may have to complete a prescribed number of days of industrial/professional training in addition to minimum credit and other requirements, to the satisfaction of the concerned department.

3.24 Time Limits for completion of Bachelor's Degree

A student must complete his studies within a maximum period of seven years for engineering and URP and eight years for architecture.

3.24 Inclusion of Repeaters from Annual System in Course System

Repeater students including Private students of Annual system will be included in the Course System of curricula as and when such situation will arise.

3.25.1 Equivalence of Courses and Grades

Equivalence of courses passed previously by any repeater student including Private students shall be determined by the respective BUGS for the purpose of:

a) Allowing course exemption, and
b) Conversion of numerical grades into letter grades in exempted courses.

3.25.2 Exemption of Courses Repeater students including private students may be granted exemption in theoretical course(s) in which he/she secured 45% or more marks and in sessional/laboratory course(s) in which he/she secured 41% or more marks.

3.25.3 Time Limit for Completion of Bachelor's Degree

Time allowed for a student included in Course System from Annual System to complete studies leading to a bachelor's degree will be proportional to the remaining credits to be completed by him/her.

A student in engineering, for example, having earned 40 credit hours through equivalence and exemption (of previously completed courses) out of a total requirement of 160 credits for bachelor's degree will get (7yrs×120/160=5.25) = 5.5 years (rounded to next higher half-a-year) or 11 (eleven) Regular Terms to fulfill all requirements for bachelor's degree. For a student in architecture, time allowed will be calculated in a similar way.

3.25.4 Relaxation of Course Registration for Students Transferred to Course System from Annual System

The requirement of registration of a minimum 15 credit hours in a term shall be waived for only the terms of the level where he/she has been transferred in course system provided that he/she has been granted exemption in some of the courses offered in those terms.

3.26 Attendance, Conduct, Discipline, etc.

3.26.1 Attendance

All students are expected to attend classes regularly. The university believes that attendance is necessary for effective learning. The first responsibility of a student is to attend classes regularly, and one is required to attend at least 60% of all classes held in every course.

3.26.2 Conduct and Discipline

A student shall conform to a high standard of discipline, and shall conduct himself/herself, within and outside the precincts of the university in a manner befitting the students of an university of national importance. He /She shall show due courtesy and consideration to the employees of the university and Halls of Residence, good neighborliness to his/her fellow students and the teachers of the university and pay due attention and courtesy to visitors.

T safeguard its ideals of scholarship, character and personal behaviour, the university reserves the right to require the withdrawal of any student at any time for any reason deemed sufficient.

3.27 Absence During Term

A student should not be absent from quizzes, tests, etc. during the Term. Such absence will naturally lead to reduction in points/marks which count towards the final grade. Absence in Term Final Examination will result in 'F' grades.

A student who has been absent for short periods, up to a maximum of three weeks due to illness, should approach the course teacher(s) or the course coordinator(s) for make-up quizzes or assignments immediately on returning to the classes. Such request should be supported by medical certificate from a university Medical officer. The medical certificate issued by registered medical practitioners (with the Registration Number shown explicitly on the certificates) will also be acceptable only in those cases where the student has valid reasons for his absence from the university).

Semester -1

Sl No.	Course Number	Course Name	Hours/Week		Credit
			Theory	Practical/ Sessional	
1	PHY 101	Physical optics, Heat, Waves and Oscillation	3	-	3
2	PHY 102	Physics Lab.	-	3	1.5
3	Chem 103	Chemistry I	3	-	3
4	Chem 103	Inorganic Quantitative Analysis	-	3	1.5
5	Math 101	Mathematics I	3	-	3
6	Hum 101	English	2	-	2
7	CE 100	Civil Engineering Drawing	-	3	1.5
8	CE 101	Engineering Mechanics	4	-	4
		Subtotal=	**15**	**9**	**19.5**

Semester -2

Sl No.	Course Number	Course Name	Hours/Week		Credit
			Theory	Practical/ Sessional	
1	PHY 201	Structure of Matter, Electricity and Magnetism and Modern Physics	3	-	3
2	Chem 202	Chemistry II			
3	Hum 201	Economics	2	-	2
4	Math 201	Mathematics II	3	-	3
5	CE 201	Civil Engineering Drawing –II	-	3	1.5
6	CE 202	Surveying	4	-	4
7	CE 203	Practical Surveying	-	3	1.5
8	EEE 202	Basic Electricity	4	-	4
9	EEE 202	Basic Electricity Sessional	-	3	1.5
10	Shop 201	Carpentry shop, Machine shop and Welding shop sessional	-	3	1.5
		Subtotal=	**16**	**9**	**22**

Semester -3

Sl No.	Course Number	Course Name	Hours/Week		Credit
			Theory	Practical/ Sessional	
1	Hum 301	Sociology	2	-	2
2	Hum 301	Government			
3	Hum 301	Principles of Accounting			
4	Math 301	Differential Equation	3	-	3
5	CE 301	Engineering Materials	4	-	4
6	CE 302	Details of Constructions	-	3	1.5
7	CE 303	Engineering Geology and Geomorphology	3	-	3
8	CE 304	Materials Sessional	-	3	1.5
9	CE 305	Mechanics of Solids I	3	-	3
10	CE 306	Structural Mechanics and Materials Sessional	-	3	1.5
		Subtotal=	**15**	**9**	**19.5**

Semester -4

Sl No.	Course Number	Course Name	Hours/Week		Credit
			Theory	Practical/ Sessional	
1	Math 401	Fourier Analysis, Harmonic Functions and Laplace Transform	3	-	3
2	Math 402	Vector Analysis and Statistics			
3	Hum 301	Sociology	2	-	2
4	Hum 301	Government			
5	Hum 301	Principles of Accounting			
6	CE 401	Numerical Methods	2	-	2
7	CE 402*	Mechanics of Solids II	3	-	3
8	CE 403	Computer Programming Sessional	-	5	2.5
9	CE 404	Quantity Surveying	-	3	1.5
10	CE 405	Fluid Mechanics	4	-	4
11	CE 406	Fluid Mechanics Sessional	-	3	1.5
		Subtotal=	**14**	**11**	**19.5**

Semester -5

Sl No.	Course Number	Course Name	Hours/Week		Credit
			Theory	Practical/ Sessional	
1	CE 501	Structural Analysis and Design I	3	-	3
2	CE 502	Structural Analysis and Design Sessional I	-	3	1.5
3	CE 503	Design of Concrete Structures I	3	-	3
4	CE 504	Environmental Engineering I	3	-	3
5	CE 505	Geotechnical Engineering I	4	-	4
6	CE 506	Geotechnical Engineering Sessional	-	3	1.5
7	CE 507	Open Channel Flow	4	-	4
8	CE 508	Open Channel Flow Sessional	-	3	1.5
		Subtotal=	**17**	**9**	**21.5**

Semester -6

Sl No.	Course Number	Course Name	Hours/Week		Credit
			Theory	Practical/ Sessional	
1	CE 601	Structural Analysis and Design II	3	-	3
2	CE 602	Design of Concrete Structures II	4	-	4
3	CE 603	Concrete Structures Sessional	-	3	1.5
4	CE 604	Geotechnical Engineering II	3		3
5	CE 605	Transportation Engineering- I: Transport & Traffic Design	3	-	3
6	CE 606	Transportation Engineering Sessional I	-	3	1.5
7	CE 607	Hydrology	3	-	3
8	CE 608	Environmental Engineering Sessional I	-	3	1.5
		Subtotal=	**17**	**9**	**20.5**

Semester -7

Sl No.	Course Number	Course Name	Hours/Week		Credit
			Theory	Practical/ Sessional	
1	CE 700**	Project and Thesis	-	3	1.5
2	CE 701	Environmental Engineering II	4	-	4
3	CE 702	Transportation Engineering Engineering II: Highway Design & Railways	4	-	4
4	CE 703	Project Planning and Management	3	-	3
5	CE 704*	Structural Analysis and Design III	4	-	4
6	CE 705	Irrigation and Flood Control	4	-	4
7	CE 706	Irrigation and Flood Control Sessional	-	3	1.5
		Subtotal=	**17**	**6**	**21**

Semester -8

Sl No.	Course Number	Course Name	Hours/Week		Credit
			Theory	Practical/ Sessional	
1	CE 700		3	-	3
2	CE 801	Structural Analysis and Design Sessional II	-	3	1.5
3	CE 802	Professional Practices and Communication	2	-	2
4	CE 803	Socio-Economic Aspects of Development Projects			
5	CE 804	Theory of Elasticity and Elastic Instability of Structures	Structure Group 2+2	-	4
6	CE 805	Prestressed Concrete			
7	CE 806	Design of Steel Structures			
8	CE 807	Introduction to Finite Element Method			
9	CE 808	Dynamics of Structures			
10	CE 809	Structural Analysis and Design Sessional-III	-	3	1.5
11	CE 810	Environmental Engineering III	Environmental Group 2+2	-	4
12	CE 811	Environmental Engineering IV		-	
13	CE 812	Environmental Engineering V			
14	CE 813	Basic Environmental Engineering			
15	CE 814	Environmental Engineering Sessional II	-	3	1.5
16	CE 815	Geotechnical Engineering III	Geotechnical Group 2+2	-	4
17	CE 816	Geotechnical Engineering IV			
18	CE 817	Geotechnical Engineering V			
19	CE 818	Geotechnical Engineering Sessional II	-	3	1.5
20	CE 819	Transportation Engineering III	Transport Group 2+2	-	4
21	CE 820	Transportation Engineering IV			
22	CE 821	Transportation Engineering V			
23	CE 822	Transportation Engineering Sessional II	-	3	1.5
24	CE 823	Groundwater Engineering	Water Resources Group 2+2	-	4
25	CE 824	River Engineering			
26	CE 825	Hydraulic Structures			
27	CE 826	Coastal Engineering			
28	CE 827	Water Resources Engineering Sessional	-	3	1.5
			Subtotal=	**17.5**	

Grand Total=(19.5+22+19.5+19.5+21.5+20.5+21.0+17.5)=159.5

CE 100 : Civil Engineering Drawing I
1.50 credit, 3 hrs/week.
Introduction - Lines and lettering, ; Plane geometry: drawing of linear and curved geometric figures, e.g. pentagon, hexagon, octagon, ellipse, parabola, hyperbola. Solid geometry: Projections of cube, prism, prism, prism, prism, cone, cylinder; developments, true shapes and sections of cube, pyramid, cone, prism; ; isometric and oblique drawings of cube, pyramid, cone. Plan, elevations and sections of one storied buildings and bridges.

CE 101 : Engineering Mechanics
4.00 credit, 4 hrs/week.

Introduction to SI Units; coplanar concurrent forces; moments and parallel coplanar forces; non-concurrent non-parallel coplanar forces; non-coplanar forces; centroids; moment of inertia of areas; moment of inertia of masses. Friction; flexible cords; plane motion; force systems that produce rectilinear motion, work, kinetic energy; power, impulse and momentum.

CE 201 : Civil Engineering Drawing –II (Computer Aided Drawing)
1.50 credit, 3 hrs/week.

Introduction to computer usage. Introduction to CAD packages and computer aided drafting: drawing editing and dimensioning of simple objects. Plan, elevations and sections of multi-storied buildings; reinforcement details of beams, slabs, stairs etc. Plan and section of septic tank; Detailed drawings of roof trusses; Plans, elevations and sections of culverts, bridges and other hydraulic structures; Building services drawings.

CE 202 : Surveying
4.00 credit, 4 hrs/week.

Reconnaissance survey; linear measurements; traverse survey; levelling and contouring; calculation of areas and volumes; problems on heights and distances; curves and curve ranging, transition curve, vertical curves. Tacheometry: introduction, principles and problems on tacheometry. Astronomical surveying: definition, instruments, astronomical corrections, systems of time. Photogrametry: introduction of terrestrial photography, aerial photography, reading of photo mossaic, scale; project surveying; errors in surveying; remote sensing; introduction to global positioning system (GPS).

CE 203 : Practical Surveying
1.50 credit, 3 hrs/week. 3 weeks

Three hours of field works based on CE-202.

CE 301 : Engineering Materials
4.00 credit, 4 hrs/week.

Properties and uses of bricks, efflorescence; cement, cement chemistry, aggregates, cement and lime mortars, concrete, standard tests of bricks, Cement and concrete, salinity problem in concrete, corrosion and its prevention, paints, varnishes, metallic coating. Design of concrete mixes; atomic structure and

bonding; crystal structures, mechanical properties, yielding, fracture, elasticity, plasticity, properties and uses of rubber, timber and plastics. Concrete for special purposes. Ferrocement.

CE 302 : Details of Constructions
1.50 credit, 3 hrs/week.

Foundations; different types of foundations; brick masonry; framed structures and bearing walls; arches and lintels; details of floors and roofs; pointing; plastering and interior finishing; scaffolding, staging; shoring and underpinning; thermal insulation and acoustics; House plumbing.

CE 303 : Engineering Geology and Geomorphology
3.00 credit, 3 hrs/week.

Minerals; identification of minerals, common rock forming minerals; physical properties of minerals; mineraloids rocks; types of rocks, cycle of rock change; earthquake and seismic map of Bangladesh. Structural geology; faults; types of faults; fold and fold type; domes; basins; erosional process; quantitative analysis of erosional land forms. Channel development; channel widening; valley shape; stream terraces; alluvial flood plains; deltas and alluvial fans; channel morphology; channel patterns and the river basin; geology and geomorphology of Bangladesh;

CE 304 : Materials Sessional
1.50 credit, 3 hrs/week.

General discussion on preparation and properties of concrete. Test for specific gravity. Unit weight, voids and bulking of aggregates; moisture content and absorption of coarse and fine aggregates; normal consistency and initial setting time of cement; direct tensile and compressive strengths of cement mortar; gradation of coarse and fine aggregates; design and testing of a concrete mix.

CE 305 : Mechanics of Solids I
3.00 credit, 3 hrs/week.

Fundamental concepts of stress and strain. Mechanical properties of materials; strain energy; stresses and strains in members subjected to tension, compression, shear and temperature changes; bending moment and shear force diagrams of beams and frames; flexural and shearing stresses in beams; shear centre; thin walled pressure containers; rivetted and welded joints.

CE 306 : Structural Mechanics and Materials Sessional
1.50 credit, 3 hrs/week.

Tension, direct shear and impact tests of mild steel specimen, compression test of timber specimen, slender column test; static bending test; hardness test of metals; helical spring tests; determination of shear centre; load-deflection behavior of simple beam.

CE 401 : Numerical Methods
2.00 credit, 2 hrs/week.

Numerical solution of algebraic and transcendental equations; solution of systems of linear equations; linear and non-linear curve-fitting by least square regression; finite differences; divided differences; interpolation; numerical differentiation and integration; numerical solution of differential equations.

CE 402 : Mechanics of Solids II
3.00 credit, 3 hrs/week.

Torsional stresses in shafts and tubes; Compound stresses; Helical springs; Transformation of stresses; deflection of beams by direct integration, moment area, elastic load and conjugate beam methods; buckling of columns.

CE 403 : Computer Programming Sessional
2.50 credit, 5 hrs/week.

Programming concepts and algorithms. Number systems; internal representation of data. Elements of structured programming language: data types, operators, expressions, control structures, functions, pointers and arrays, input and output. Concept of Object Oriented Programming (OOP): encapsulation, inheritence, polymorphism and abstraction. Template functions and classes. Development of programs related to Civil Engineering.

CE 404 : Quantity Surveying
1.50 credit, 3 hrs/week. Quantity estimates of items of civil works e.g. building, bridge, truss and highway. Analysis of rates; use of software in quantity surveying; Specifications of materials of construction projects.

CE 405: Fluid Mechanics
4.00 Credit, 4 hrs/week.

Development and scope of fluid mechanics. Fluid properties. Fluid statics. Kinematics of fluid flow. Fluid flow concepts and basic equations continuity equation, Bernoulli's equation, energy equation, momentum equation and forces in fluid flow. Similitude and dimensional analysis. Steady incompressible flow in pressure conduits, laminar and turbulent flow, general equation for fluid friction. Empirical equations for pipe flow. Minor losses in pipe flow. Fluid measurement: Pitot tube, orifice, mouthpiece, nozzle, venturimeter, weir. Pipe flow problems pipes in series and parallel, branching pipes, pipe networks.

CE-406: Fluid Mechanics Sessional
1.5 Credit, 3 hrs/week.

Centre of pressure. Proof of Bernoulli's theorem. Flow through Venturimeter. Flow through orifice. Coefficient of velocity by coordinate method. Flow through mouthpiece. Flow over V notch. Flow over sharp crested weir. Fluid friction in pipe.

CE 501 : Structural Analysis and Design I
3.00 credit, 3 hrs/week

Stability and determinacy of structures; analysis of statically determinate trusses and arches; influence lines; moving loads on beams, frames and trusses; cables and cable supported structures.

CE 502 : Structural Analysis and Design Sessional I
1.50 credit, 3 hrs/week.

Analysis of steel structures e.g. truss, plate girder; design of members and joints of structures; use of software in analysis and design problems.

CE 503 : Design of Concrete Structures I
3.00 credit, 3 hrs/week.

Fundamental behavior of reinforced concrete; introduction to WSD and USD methods; analysis and design of singly reinforced, doubly reinforced and T-beams according to WSD and USD methods; diagonal tension; bond and anchorage according to WSD and USD methods; one way slabs.

CE 504 : Environmental Engineering I
3.00 credit, 3 hrs/week.

Water Supply Engineering: introduction; water demands; water supply sources; ground water exploration: aquifer properties and ground water flow, well hydraulics, water well design, drilling, construction and maintenance; water demand for rural communities; shallow hand tube wells and deep set Tara pumps for problem areas. Surface water collection and transportation; head works; pumps and pumping machineries; water distribution system; analysis and design of distribution network; fire hydrants; water meters; leak detection; unaccounted for water. Water quality requirements; water treatment - plain sedimentation, flocculation and settlement, filtration, disinfection; miscellaneous treatment methods; low cost treatment methods for rural communities.

CE 505 : Geotechnical Engineering I
4.00 credit, 4 hrs/week

. Introduction to geotechnical engineering; formation, type and identification of soils; soil composition; soil structure and fabric; index properties of soils; engineering classification of soils; soil compaction; principles of total and effective stresses; permeability and seepage; stress-strain-strength characteristics of soils; compressibility and settlement behaviour of soils; lateral earth pressure; stress distribution.

CE 506 : Geotechnical Engineering Sessional
1.50 credit, 3 hrs/week.

Field identification tests; grain size analysis by sieve and hydrometer; specific gravity test; atterberg limits test; permeability tests; unconfined compression test; compaction test; relative density test; direct shear tests; consolidation tests.

CE 507: Open Channel Flow
4.00 Credit, 4 hrs/week.

Prereq. WRE 201 Open channel flow and its classification. Velocity and pressure distributions. Energy equation, specific energy and transition problems. Critical flow and control. Principles of flow measurement and devices. Concept of uniform flow, Chezy and Manning equations, estimation of resistance coefficients and computation of uniform flow. Momentum equation and specific momentum.

Hydraulic jump. Theory and analysis of gradually varied flow. Computation of flow profiles. Design of channels.

CE 508: Open Channel Flow Sessional
1.5 Credit, 3 hrs/week.

Broad crested weir. Sluice gate. Venturi flume. Parshall flume. Cut throat flume. Hydraulic jump. Velocity distribution profile. Manning's roughness coefficient. Specific force and specific energy. .

CE 601 : Structural Analysis and Design II
3.00 credit, 3 hrs/week.

Wind and earthquake loads; approximate analysis of statically indeterminate structures. e.g. braced trusses, portal frames, mill bent and multi storied building frames; deflection of beams, trusses and frames by virtual work method; space trusses; analysis of statically indeterminate structures by consistent deformation.

CE 602 : Design of Concrete Structures II
4.00 credit, 4 hrs/week.

Two-way slabs; columns; footings; retaining walls, reinforced concrete floor and roof systems. Review of codes; yield line method; introduction of prestressed concrete. Analysis and preliminary design of prestressed beam section.

CE 603 : Concrete Structures Sessional
1.50 credit, 3 hrs/week.

Analysis and design problems based on CE-503; design of a slab bridge, simple girder bridge and a low-rise building.

CE 604 : Geotechnical Engineering II
3.00 credit, 3 hrs/week.

Soil investigation techniques; settlement computation; types of foundations; bearing capacity of shallow and deep foundations; settlement and distortion of foundations; design and construction of footings, rafts and piles; slope stability analyses.

CE 605 : Transportation Engineering- I: Transport & Traffic Design
3.00 credit, 3 hrs/week.

Introduction to transportation engineering; development of transportation systems; elements of transportation system; transportation in Bangladesh; modal share; transportation planning concepts: collection, study and analysis of basic data; highway location and surveys; geometric design of highways: elements of design, cross-section elements, curves and sight distances; road intersections; traffic engineering: the road/traffic system, vehicle and traffic characteristics, traffic control devices, traffic studies, parking and roadway lighting; waterways and terminals.

CE 606 : Transportation Engineering Sessional I
1.50 credit, 3 hrs/week.

Tests of bituminous materials, tests on subgrade, sub-base and base materials; bituminous mix design; roadway capacity analysis; application of analytical, simulation and statistical packages.

CE 607: Hydrology
3.00 Credit, 3 hrs/week.

Hydrologic cycle. Weather and Hydrology. Precipitation, Evaporation and transpiration. Infiltration. Streamflow. Application of telemetry and remote sensing in hydrologic data acquisition. Rainfall runoff relations. Hydrographs, unit hydrographs. Hydrologic routing. Statistical methods in hydrology.

CE 608 : Environmental Engineering Sessional I
1.50 credit, 3 hrs/week.

Water and wastewater sampling techniques, sample preservation, physical, chemical and biological tests of water and wastewater; breakpoint chlorinating, alum coagulation, sampling and laboratory analysis of air, sampling and laboratory analysis of solid waste.

CE 700 : Project and Thesis
1.50 credit, 3 hrs/week.

Experimental and theoretical investigation of various topics in structural engineering, concrete technology, environmental engineering, transportation engineering and geotechnical engineering. Individual or group study of one or more topics from any of the above fields. The students will be required to submit thesis/project report at the end of the work.

CE 701 : Environmental Engineering II
4.00 credit, 4 hrs/week.

Wastewater Engineering: introduction; water supply, sanitation and health; estimation of wastewater; wastewater collection systems; hydraulics of sewer; design, construction and maintenance of sanitary sewer and storm drainage system; sewer appurtenances; plumbing system. Microbiology of sewage and waste water; wastewater characteristics; preparatory, primary and secondary treatment methods and disposal; treatment and disposal of industrial effluents; sludge treatment and disposal; sanitation for low income communities - on-site sanitation systems for rural communities; low cost small bore sewerage for small townships; design and construction of septic tanks, soak wells and subsurface drain fields; rural sanitation in Bangladesh. Sustainability of water and sanitation services; participatory development approach in water and sanitation sector; community management of water and sanitation services; introduction to environment, environmental pollution; environment protection and management.

CE 702 : Transportation Engineering Engineering II: Highway Design & Railways
4.00 credit, 4 hrs/week.

Highway materials; subgrade, subbase and base courses; soil stabilization and soil aggregates in road constructions; low-cost roads; production, properties and uses of bituminous materials and mix design methods; design, construction and maintenance of flexible and rigid road pavements; equipments;

railways: general requirements, alignment, permanent way, station and yards, signalling, points and crossings, maintenance.

CE 703 : Project Planning and Management
3.00 credit, 3 hrs/week.

Principles of management; principles of construction management; construction contracts and specifications; inspection and quality control; construction safety; construction planning and scheduling: PERT, CPM, case studies, resource scheduling; PERT: a cost accounting system, linear programming. Psychology in administration; materials management; demand forecasting; inventory control; stores management; procurement. Project planning and evaluation; feasibility reports, cash flow, pay back period, internal rate of return. Benefit-cost ratio, construction equipments and plants. Replacement studies.

CE 704: Structural Analysis and Design III
4.00 credit, 4 hrs/week. Prereq. CE 601

Analysis of statically indeterminate structures by displacement method; slope deflection, moment distribution, stiffness matrix; member stiffness; stiffness transformations; assembly of stiffness matrices and solution for beams, frames and trusses. Flexibility matrix. Influence lines for statically indeterminate beams, frames, arches and grids. Structural forms and their applications.

CE 705: Irrigation and Flood Control
3.00 Credit, 3 hrs/week.

Importance of irrigation. Sources and quality of irrigation water. Soil water relationship. Consumptive use and estimation of irrigation water requirements. Methods of irrigation. Design of irrigation canal system. Irrigation structures. Irrigation pumps. Problems of irrigated land. Flood and its control.

CE 706: Irrigation and Flood Control Sessional
1.5 Credit, 3 hrs/week.

Soil water relationship: soil properties, use of tensiometer, infiltration rate. Losses in irrigation system. Irrigation requirement and scheduling. Aquifer characteristics and estimation of yield from irrigation wells. Analysis of hydrologic data for irrigation and flood control. Design of irrigation and drainage canal network. Pumps in series and parallel. Pump characteristics. Flow through canal regulating structures.

CE 801 : Structural Analysis and Design Sessional II
1.50 credit, 3 hrs/week.

Design of various reinforced concrete structures, e.g. cantilever bridge and multistoried building.

CE 802 : Professional Practices and Communication
2.00 credit, 2 hrs/week.

The project cycle; project proposal; contractual provisions; techniques of specification writing; evaluation of bids; project evaluation. Interpretation of literature, documents etc.; communicating; preparation of report; industrial and labour relations; professional ethics in Civil Engineering.

CE 803 : Socio-Economic Aspects of Development Projects
2.00 credit, 2 hrs/week.

Economic and social structure; development and economic growth; socio-economic indicators; population, prosperity and poverty; employment of workforce; population displacement; rehabilitation strategy; productivity, land loss, land use and land ownership patterns; fisheries and aquaculture; deforestation and afforestation; communication, commerce, industries and other economic benefits; water supply, sanitation, health and nutrition; inequalities in distribution of benefits and losses; socio-economic survey; case studies.

CE 804 : Theory of Elasticity and Elastic Instability of Structures
2.00 credit, 2 hrs/week.

Introduction to theory of elasticity; plane stress and plane strain conditions; Two-dimensional problems in rectangular and polar coordinates; torsion of circular and noncircular shafts; instability of structures; stability functions.

CE 805: Prestressed Concrete
2.00 credit, 2 hrs/week.

Prestressed concretes: materials; prestressing systems; loss of prestress; analysis of sections for flexure, shear, bond and bearing; beam deflections and cable layout; partial prestress. Design of prestressed sections for flexure, shear, bond and bearing.

CE 806: Design of Steel Structures
2.00 credit, 2 hrs/week.

Behaviour of structural steel members and steel frames; code requirements; design of tension and compression members by WSD and LFD methods; design of beam, beam-columns; Joint design.

CE 807: Introduction to Finite Element Method
2.00 credit, 2 hrs/week.

Introduction to finite element method as applied to Civil Engineering problems. One dimensional stress deformation and time dependent flow problem. Two dimensional plane stress and plane strain analysis of stress deformation problems.

CE 808 : Dynamics of Structures
2.00 credit, 2 hrs/week.

Formulation of equation of motion; free vibration response; SDOF and MDOF systems; response to harmonic and impulse loading and vibration analysis by Rayleigh's method.

CE 809: Structural Analysis and Design Sessional-III (Computer Aided Analysis and Design of Structures)
1.50 credit, 3 hrs/week.

Use of structural analysis and design software; design of various reinforced concrete structures, e.g. building, water tower, folded plate roof.

CE 810 : Environmental Engineering III
2.00 credit, 2 hrs/week.

Solid Waste Management: sources and types of solid wastes; physical and chemical properties of solid wastes; solid wastes generation; on-site handling, storage and processing; collection of solid wastes; transfer stations and transport; ultimate disposal methods; resources and energy recovery; soil pollution. Industrial solid waste collection and disposal; hazardous waste management.

CE 811 : Environmental Engineering IV
2.00 credit, 2 hrs/week.

Environment Pollution and Its Control: water pollution - sources and types of pollutants; waste assimilation capacity of streams; dissolved oxygen modelling; ecological balance of streams; industrial pollution; heavy metal contamination; detergent pollution and eutrophication; ground-water pollution ; marine pollution; pollution control measures - water quality monitoring and management. Air pollution - sources and types of pollutants; effects of various pollutants on human health, materials and plants; air pollution meteorology; global warming and greenhouse effects ; air pollution monitoring and control measures.

CE 812 : Environmental Engineering V
2.00 credit, 2 hrs/week.

Environment and Development Projects: environment and sustainable development; environmental policies and legislation; environmental implication of sectoral development; environmental quality standards; environmental issues and priorities; environmental impact assessment of development schemes - baseline studies, assessment methodologies; economics of environmental management; special topics.

CE 813 : Basic Environmental Engineering
2 hours in a week, 2.00 Cr.

Introduction to environmental engineering; man and environment interaction. Water Supply: objectives and basic elements of water supply system; water requirements; population prediction and water demand assessment; fire demand; planning of water supply systems - sources, abstraction, transmission, treatment and distribution. Sanitation: urban and rural sanitation; low-cost sanitation technologies; elements of a conventional waterborne sewerage system - collection, transportation, treatment and disposal; planning of sanitation systems. Solid waste management: sources and classification; on-site storage and handling; collection, transportation and disposal; sanitary land filling method; waste recycling and reuse. Environmental pollution - air, water and soil; noise pollution.

CE 814 : Environmental Engineering Sessional II
1.50 credit, 3 hrs/week.

Design of water supply and sewage system; design of water and wastewater treatment plant; computer application in environmental engineering, field visits and reporting.

CE 815 : Geotechnical Engineering III
2.00 credit, 2 hrs/week.

Foundation for structures subjected to lateral loads; retaining walls and abutments; operation and methods of construction, dewatering and slurry-wall construction. Flexible earth retaining structures, sheet piles, cofferdams, caissons; machine foundations- elementary vibrations, shear modulus and elastic constants, foundation design for vibration, fundamentals of soil liquefaction.

CE 816 : Geotechnical Engineering IV
2.00 credit, 2 hrs/week.

Introduction to critical state soil mechanics, SHANSEP and stress path methods; Stress deformation and failure of soil masses. One, two and three dimensional consolidation problems; pore pressure coefficients; soil structure-interaction; earthquake and liquefaction problems; soil improvement; numerical solution of geotechnical engineering problems.

CE 817 : Geotechnical Engineering V
2.00 credit, 2 hrs/week.

Introduction to soil-water interaction problems. Permeability, capillarity and soil suction. Seepage analysis, stability of natural, man made slopes and excavations subjected to seepage, water current, wave action etc. Theories of filters and revetment design; hydraulic fills.

CE 818 : Geotechnical Engineering Sessional II
1.50 credit, 3 hrs/week.
Computer aided design of foundations, retaining walls and reinforced soils, slope stability analysis, techniques of soil improvement, use of computer in geotechnical engineering.

CE 819 : Transportation Engineering III: Traffic Planning & Management
2.00 credit, 2 hrs/week.
The transportation planning process; traffic management concepts; traffic accident investigations; city road and street networks: grade separation and interchanges, pedestrian and bicycle facilities. The urban bypass; environmental aspects of highway traffic and transportation projects; elements of traffic flow.

CE 820 : Transportation Engg IV: Highway Drainage & Airports
2.00 credit, 2 hrs/week.
Highways drainage and drainage structures. Evaluation and strengthening of pavements; importance, advantages and trends in air transportation; planning and design of airports; aircraft characteristics related to airport design; types and elements of airport planning studies; airport configuration; geometric design of the landing area; Terminal area; heliports; design of airport pavements; lighting, marking and signing; Airport drainage.

CE 821 : Transportation Engg V: Transport Projects and Operations
2.00 credit, 2 hrs/week.
Highway needs study; highway planning, economics and financing; evaluation and analysis of transportation projects. management, monitoring; organization and implementation of transportation

projects; selected case studies; traffic engineering administration and legislation; urban public transportation and freight movement.

CE 822 : Transportation Engineering Sessional II
1.50 credit, 3 hrs/week.
Design of rigid and flexible highway and air field pavements; geometric design: road intersections and interchanges; capacity calculations; traffic studies and design.

CE 823: Groundwater Engineering
2.00 Credit, 2 hrs/week.
Groundwater in hydrologic cycle and its occurrence. Physical properties and principles of groundwater movement. Groundwater and well hydraulics. Groundwater resource evaluation. Groundwater levels and environmental influences. Water mining and land subsidence. Groundwater pollution and contaminant transport. Recharge of groundwater. Saline water intrusion in aquifers. Groundwater management

CE 824: River Engineering
2.00 Credit, 2 hrs/week.
Behaviour of alluvial rivers. River channel pattern and fluvial processes. Aggradation and degradation, local scours, river training and bank protection works. Navigation and dredging Sediment movement in river channels, bed forms and flow regimes.

CE 825: Hydraulic Structures
2.00 Credit, 2 hrs/week.

Principles of design of hydraulic structures, types of hydraulic structures. Design of dams, barrages, weirs, spillways, energy dissipators and spillway gates. Cross drainage works.

CE 826: Coastal Engineering
2.00 Credit, 2 hrs/week.

Coast and coastal features. Tides and currents. Tidal flow measurement. Waves and storm surges. Docks and harbours. Forces of waves and tides in the design of coastal and harbour structures. Coastal sedimentation processes. Deltas and estuaries. Shore protection works. Dredging and dredgers.

CE 827: Water Resources Engineering Sessional
1.5 Credit, 3 hrs/week.

Design of hydraulic structures, river training works. Groundwater resource assessment and water well design.

EEE 201 : Basic Electricity
3.00 Credit, 3 hrs/week.

Electrical units and standards, Electrical network and circuit solution series, parallel and mesh current methods. Instantaneous current, voltage and power, effective current and voltage, average power. Sinusoidal single phase RLC circuits: phasor algebra, balanced three phase circuits. Electrical wiring for residential and commercial loads. Introduction to transformers and induction motors.

EEE 202 : Basic Electricity Sessional
3 hours/ week, 1.5 Cr.

Laboratory experiments based on EEE 201.

Phy 101: Physical optics, Heat, Waves and oscillation
3.00 Credit, 3 hrs/week.
Physical Optics: theories of light: Huygen's principle and construction. Interference of light: Young's double slit experiment, Fresnel bi-prism, Newton's rings, interferometers. Diffraction of light: Fresnel and Fraunhoffer diffraction, diffraction by single slit, diffraction by double slit, diffraction gratings, polarization, production and analysis of polarized light, optical activity, optics of crystals.

Heat and Thermodynamics: Temperature, zeroth law of thermodynamics. Thermometers: constant volume, platinum resistance, thermocouple. First law of thermodynamics and its application, molar specific heats of gases, isothermal and adiabatic relations, work done by a gas. Kinetic theory of gases: explanation of gas laws, kinetic interpretation of temperature, equipartition of energy and calculation of ratio of specific heats, mean free path, Vander Waals equation of state, second law of thermodynamics: reversible and irreversible processes, Carnot cycle, efficiency, Carnot's theorem, entropy.
Waves and Oscillations. oscillations: Simple harmonic motion, damped simple harmonic oscillations, forced oscillations, resonance, vibrations of membranes and columns. Combination and composition of simple harmonic motions, Lissajous' figures. Transverse and longitudinal nature of waves, travelling and standing waves, intensity of a wave, energy calculation of progressive and stationary waves, phase velocity, group velocity. Sound waves: velocity of longitudinal wave in a gaseous medium. Doppler effect. architectural acoustics: Sabine's formula, requisites of a good auditorium.

Phy 102: Physics Lab.
1.50 Credit, 3 hrs/week.
Determination of the specific heat of a liquid by the method of cooling. Determination of the thermal conductivity of a bad conductor by Lee's method. Determination of the pressure co-efficient of air by constant volume air thermometer. Determination of the frequency of a tuning fork by Melde's apparatus. Determination of the focal length of concave lens by auxiliary lens method. Measurement of unknown resistance and verification of the laws of resistance by P.O. (Post Office) box. Comparison of the E.M.F's of two cells by potentiometer. Determination of the mechanical equivalent of heat by electrical method. Determination of the radius of curvature of a plano-convex lens by Newton's ring method. Determination of threshold frequency for the photoelectric effect of a photocathode and the value of the Planck's constant. To plot thermo-electromotive force-temperature (calibration) curve for a given thermocouple. Determination of the melting point of a solid using the calibration curve. Determination of the specific rotation of sugar solution by a polarimeter. Determination of the temperature co-efficient of the resistance of the material of a wire. Determination of the refractive index of the material of a prism using spectrometer. Determination of the spring constant and the effective mass of a loaded spring.

Phy 201: Structure of matter, Electricity and magnetism and Modern physics
3.00 Credit, 3 hrs/week. Prereq. Phy 101

Structure Matter: States of matter: solid, liquid and gas. Classification of solids: amorphous, crystalline, ceramics and polymers. Atomic arrangement in solids. Different types of bonds in solids:

metallic, Vander Waals, covalent and ionic bond, packing in solids, interatomic distances and forces of equilibrium, x-ray diffraction; Bragg's law. Plasticity and elasticity. Distinction between metal, insulator and semi-conductor.

Electricity and Magnetism: Electric charge, Coulomb's law. the electric field: calculation of the electric field strength, E; a dipole in an electric field, electric flux and Gauss's law, some application of Gauss's law; electric potential V, relation between E and V, electric potential energy. Capacitors; capacitance, dielectrics: an atomic view, dielectrics and Gauss's law; current and resistance: current and current density, Ohm's law, resistivity: an atomic view, Ampere's law, Faraday's law, Lenz's law, self inductance and mutual inductance.

Magnetic properties of matter: magnetomotive force, magnetic field intensity, permeability, susceptibility, classifications of magnetic materials, magnetisation curves. Modern Physics. Michelson Morley's experiment, Galilean transformation, special theory of relativity, Lorentz-transformation, relative velocity, length contraction, time dilation, mass-energy relation. Photo-electric effect, Compton effect, de-Broglie wave, Bohr's atom model. Radioactive decay, half life, mean life, isotopes, nuclear binding energy, alpha, beta, gamma decay.

Chem 103 : Chemistry – I
3.00 Credit, 3 hrs/week.
Atomic structure, periodic table, chemical bonds. Chemistry of cement, silicates and limes. Physical and chemical properties of water. Different types of solutions, concentration units. Chemical equilibria and thermochemistry.

Chem 104 : Inorganic Quantitative Analysis (Sessional)
1.5 Credit, 3 hrs/week.
Volumetric analysis: acid-base titration, oxidation-reduction titrations, determination of Fe, Cu and Ca volumetrically.

Chem 203 : Chemistry-II
3.00 Credit Hours, 3 hrs/week. Prereq. Chem 103

Reactions kinetics: rate of chemical reactions; order and molecularity of reactions, different types of rate expressions, methods of determining rate and order, effect of temperature on reaction rate and energy of activation. **Colloid and colloidal solution:** classification, preparation, purification, properties, protective action and application of colloids. **Chemical corrosion:** introduction to chemical corrosion, corrosion of metals and alloys in dry and wet environments, mechanism of corrosion, atmospheric and soil corrosion and their protective measures.
Chemistry of environmental pollution: environment and its characteristics, chemistry of toxic metal and non-metal pollutants, analytical techniques used in the determination of pollutants, chemical concept of DO, BOD, COD and threshold odor number, chemistry involved in water treatment plants, quality of industrial waste water.
Polymers: chemistry of polymerization, different types of polymers and their properties, polymer degradation, elastomers and composite materials.

Paints and varnishes: introduction to paints and varnishes, pretreatment of the surface, metallic, non-metallic and organic protective coating, types of paints and their uses.

Math 131: Mathematics -I
3.00 Credit, 3 hrs/week.
Differential Calculus: Limit, Continuity and differentiability. n-th derivatives of standard functions. Leibnit'z theorem. Rolle's theorem, Mean value theorem. Expansion in finite and infinite forms. Indeterminate form. Partial differentiation. Euler's theorem. Tangent and Normal. Subtangent and subnormal in partial and polar co-ordinates. Maxima and minima of functions of single variables. Curvature.

Integral Calculus: Integration by parts. Standard integrals. Integration by the method of successive reduction. Definite integrals. Improper integrals. Beta function. Gama function. Multiple integrals. Area, Volume of solids of revolution

Math 201: Mathematics-II
3.00 Credit, 3 hrs/week.
Matrices: Definition of matrix. Algebra of matrices. Multiplication of matrices. Transpose of a matrix and inverse of matrix. Rank and elementary transformation of matrices. Solution of linear equations. Linear dependence and independence of vector. Quadratic forms. Matrix polynomials. Determination of characteristic roots and vectors. Null space and nullity of matrix. Characteristic subspace of matrix.
Three Dimensional Co-ordinate Geometry: System of co-ordinates. Projection. Direction Cosines. Equations of planes and lines. Angle between lines and planes. Distance from a point to a plane. Co-planar lines. Shortest distance between two given straight lines. Standard equation of conicoids; sphere ellipsoid. Hyperboloid of one sheet, hyperboloid of two sheets. Tangent planes. Normal lines. Condition of tangency.

Math 301: Differential Equations
3.00 Credit, 3 hrs/week.
Differential Equation: Definition. Formation of differential equations. Solution of first order differential equations by various methods. Solution of differential equation of first order and higher degrees. Solution general linear equations of second and higher orders with constant co-efficient. Solution of Euler's homogeneous linear equations. Solution of differential equations in series by the method of Frobenius. Bessel's functions, Legendre's polynomials and their properties.
Partial Differential Equation: Introduction. Equations of the linear and non-linear first order. Standard forms. Linear equations of higher order-. Equations of the second order with variable co-efficient.

Math 401 : Fourier Analysis, Harmonic Functions and Laplace Transform
3.00 Credit, 3 hrs/week.
Fourier Analysis: Real and complex form. Finite transform. Fourier Integral. Fourier transforms and their uses in solving boundary value problems. Harmonic functions: Definition of harmonics. Laplace equation in cartesian, polar cylindrical and spherical co-ordinates. Solutions of these equations together with applications. Gravitational potential due to a ring. Steady-state temperature. Potential inside or outside of a sphere. Properties of harmonic functions.

Laplace Transforms: Definition. Laplace transforms of some elementary functions. Sufficient conditions for existence of Laplace transforms. Inverse Laplace transforms. Laplace transforms of derivatives. The unit step function. Periodic function. Some special theorems on Laplace transforms. Partial fraction. Solutions of differential equations by Laplace transforms. Evaluation of improper integral.

Math 402 : Vector Analysis and Statistics

3.00 Credit, 3 hrs/week.

Vector Analysis: Scalars and vectors, equality of vectors. Addition and subtraction of vectors. Multiplication of vectors by scalars. Position vector of a point. Resolution of vectors. Scalar and vector product of two vectors and their geometrical interpretation. Triple products and multiple products. Application to geometry and mechanics. Linear dependence and independence of vectors. Differentiation and integration of vectors together with elementary applications. Definition of line, surface and volume integral. Gradient, divergence and curl of point functions. Various formulae. Gauss's theorem, stoke's theorem, Green's theorem and their applications.

Statistics: Frequency distribution. Mean, median, mode and other measures of central tendency. Standard deviation and other measures of dispersion. Moments, skewness and kurtosis. Elementary probability theory and discontinuous probability distribution, e.g. binomial, poison and negative binomial. Continuous probability distributions, e.g. normal and exponential. Characteristics of distributions. Elementary sampling theory. Estimation. Hypothesis testing and regression analysis.

Hum 101: English

2 Credit, 2 hrs/week.

English phonetics: the places and manners of articulation of the English sounds. Vocabulary English grammar: construction of sentences, some grammatical problems. comprehension. Composition on current affairs. Precis writing. Report writing. Commercial correspondence and tenders. Short stories written by some well known classic writers.

Hum 201 : Economics

2.00 Credit, 2 hrs/week.

Definition of Economics. Economics and Engineering. Principles of Economics: Micro economics: The theory of demand and supply and their elasticities. Price determination. Nature of an economic theory, applicability of economic theories to the problems of developing countries. Indifference curve technique. Marginal analysis. Optimization. Market. Production, Production function, types of productivity. Rational region of production of an engineering firm. The Short run and the Long run. Fixed cost and variable cost. Internal and external economics and diseconomies. Macro - economics: Savings, investment. National income analysis. Inflation. Monetary policy, Fiscal policy and Trade policy with reference to Bangladesh. Planning in Bangladesh.

Hum 301: Sociology

2.00 Credit, 2 hrs/week.

Scope, some Basic Concepts. Social evolution and techniques of production, culture and civilization. Social structure of Bangladesh. Population and world resources. Oriental and Occidental societies,

Industrial revolution. Family urbanization and industrialization, Urban Ecology, Co-operative and Socialist movements. Rural Sociology.

Hum 302: Government
2.00 Credit, 2 hrs/week.

Some basic concepts of government and Politics. Functions, organs and forms of modern state and Government; socialism, Fascism, Marxism, U.N.O. Government and politics of Bangladesh. Some major administrative systems of developed countries. Local self-government.

Hum 303: Principles of Accounting
2.00 Credit, 2 hrs/week.

Principles of accounting: accounts, transactions, the accounting procedures and financial statements. Cost in general: objectives and classifications. Overhead costing. Cost sheet under job costing operating costing and process costing. Marginal costing: tools and techniques, cost-volume-profit analysis. Relevant costing: analyzing the profitability within the firm, guidelines for decision making. Long-run planning and control: capital budgeting.

Shop 201: Carpentry shop, Machine shop and Welding shop sessional
1.50 Credit, 3 hrs/week.

Carpentry shop (3/2 hrs./week)
Wood working tools**;**Wood working machine: Band saw, scroll saw, circular saw, jointer, thickness planer, disc sander, wood lathe; Types of sawing; Common cuts in wood works; Types of joint; Defects of timber: Natural defects and artificial defects; Seasoning; Preservation; Substitute of timber; Commercial forms of timber. Characteristics of good timber; Use of fastening; Shop practice: Practical job, planning and estimating of a given job.

Machine shop (3/4 hrs/week)
Kinds of tools; Common bench and hand tools; Marking and layout tools, measuring tools, cutting tools, machine tools, bench work with job. Drilling, Shapar, Lathe and Milling Machines: Introduction, type, size and capacity, uses and applications.

Welding shop (3/4 hrs/week)
Methods of metal joints: Riveting, grooving soldering, welding; Types of welding joints and welding practice; Position of arc welding and polarty: Flat, vertical, horizontal, overhead; Electric Arc welding and its machineries; Welding of different types of materials: Low carbon steel, cast iron, brass, copper, stainless steel, aluminium; Types of electrode, fluxes and their composition; Arc welding defects; Test of Arc welding: Visual, destructive and non-destructive tests. Types of gas welding system and gas welding equipment; Gases and types of flame; welding of different types of materials; Gas welding defects; test of gas welding.