
The University

Ahsanullah University of Science and Technology, Dhaka (Bangladesh) is the first established private University of Engineering and Technology in Bangladesh. On 2 May, 1995, the Government of Bangladesh formally approved the establishment of Ahsanullah University of Science and Technology (AUST) in Dhaka under the Private University Act of 1992. In its fourteenth year, and with about four thousand students, two hundred highly-qualified teachers including about 175 fulltime faculty members and well-equipped laboratories, the university plays now a significant role in engineering and technology education in the country. The University is striving not only to maintain high quality in teaching and research but also to render community services through dissemination of information, organization of training programs and other activities. It provides, at a reasonable cost, undergraduate and post graduate education characterized by academic excellence in a range of subjects that are particularly relevant to the present and anticipated needs of the society. It aims to provide students with opportunities, resources and expertise to achieve academic excellence within stimulating and supportive environment. The university was sponsored by Dhaka Ahsania Mission (DAM), the largest Bangladeshi NGO involved in very extensive programs in education, health and socio-economic development sectors in the country. DAM plays an active role in a number of national and international forums and organizations and has a Consultative Status with UNESCO.

Faculties: There are three faculties:

1. Faculty of Architecture and Planning: Under this faculty there is one Department: the Department of Architecture. The Department offers a 5-year degree course leading to the degree of Bachelor of Architecture (B Arch.).
2. Faculty of Engineering: There are four departments under this faculty: All the Departments offer 4-year degree courses each leading to the Bachelors degree.
 - Department of Civil Engineering.

- Department Electrical and Electronic Engineering.
- Department of Computer Science and Engineering.
- Department of Textile Technology.

In addition, the Department of Arts and Sciences provides support services to the above five department.

3. Faculty of Business and Social Science: Under this faculty there is one Department, the Department of Business Administration. The Department offers a 4-year degree course leading to the degree of Bachelor of Business Administration. The Department also offers 2-years Master of Business Administration Program both Regular and Executive.

The Campus:

The campus of the University has been constructed on a 5-bigha (72000 square feet) plot of land acquired in Tejgaon Industrial area which is located in the heart of Dhaka City and the area is due to change from an industrial to a commercial land use in the years ahead.

An eight storied building comprising of four interconnected blocks with two basements has been constructed. The total floor area is more than 400,000 square feet. The basements can accommodate about 200 cars.

The building has sufficient space for accommodation for all kinds of facilities to be needed for the University. The following facilities are proposed to be available here:

- a. Office space for administration and management.
- b. Requisite class rooms for all the academic disciplines.
- c. Laboratory/workshops.
- d. Central library.
- e. Common rooms for students (male and female).
- f. Health care centre.
- g. Prayer room.
- h. Book shop, indoor games and cafeteria.
- i. Other facilities will be provided according to the requirement of the University.

Civil Engineering Department

The Department of Civil Engineering was established in 1995. The total enrolment in the 4-year B.Sc. program is about 500. A class size of about 50 students is maintained for effective teaching.

There are now 21 full-time faculty members including five professors with PhD degrees. In addition, there are 4 part-time teachers including 3 professors. Three faculty members are on leave for higher studies. More full-time teachers will be on board as a general policy of the Department to enhance the Department's strength in teaching and research.

The Department established most of its laboratories with sophisticated equipments on its current campus. At some stages, the Department used some of the labs of Technical Teachers' Training College (TTTC) and Bangladesh University of Engineering and Technology (BUET). Process is going on to establish all labs at the new campus with modern and sophisticated equipment to support all teaching and research works at the Department

The B.Sc. degree offered by the Civil Engineering Department at AUST is officially recognized by the Institution of Engineers, Bangladesh. Graduates of the Department have a very good record of employment in various public and private organizations. Many have joined post-graduate studies in Bangladesh (mainly at BUET) and other universities in various countries. The Department is making necessary arrangement to offer post-graduate programs in the near future.

Academic Information

Entry Qualification: Minimum requirement for admission to any of the Architecture and Engineering degree programs is a Higher Secondary Certificate (HSC), or A-Level or equivalent, in Science with Physics,

Chemistry and Math. Students with high performance in HSC/A-Level or equivalent can apply for admission.

Medium of Instruction: All lectures are delivered in English and as such proficiency in English is a pre-requisite for the candidates to get admission in the degree programs.

Number of Students: The current total enrollment is slightly over 3500 of which 2800 are in the engineering faculty.

Number of Semesters in a Year: There are two semesters in a year. The duration of each semester is 20 working weeks, which are used as follows:

| | |
|--|-------------------|
| Classes | about 13-15 weeks |
| Preparatory leave and semester final examination | 5 weeks |
| <hr/> | |
| Total: | 20 weeks |

Short-term courses may be arranged in between the semesters as and when required.

Attendance: In all degree programs the students are required to attend at least 60% of the classes held in each subject in a semester, failing may bar them to sit for the semester Final and Clearance Examinations.

Examinations, Grading System and GPA Requirements:

1. The total performance of a student in a given course will be based on:
 - (i) Continuous assessment (attendance, quizzes, assignments etc.).
 - (ii) Semester final examination.
 - (iii) Clearance examination (for clearance of carry/uncleared courses), if any.
 - (iv) Improvement examination, if any.

2. The continuous assessment and the semester final examination will form the normal or regular examination system while the clearance examination and the improvement examination will provide additional opportunities to students with poor or unsatisfactory performance as per rules.
3. The distribution of marks between the continuous assessment and the semester final examination will be as follows:

| | |
|--|------|
| (i) Class participation (i.e. class attendance, class performance, etc.) | 10% |
| (ii) Quizzes and/or assignments | 20% |
| (iii) Semester final/clearance /carry-over/improvement examination | 70% |
| Total: | 100% |

The number of quizzes and/or assignments in a course of study shall not exceed $n+1$, where n is the number of credits of the course. Evaluation of the performance will be on the basis of the best n quizzes and/or assignments.

4. Clearance examination in a course will be held only for those students who have obtained 'F' in the course in regular examinations. Clearance examinations will be held over a period of 1 to 2 weeks at the end of each semester.
5. Clearance examination in a course will carry 100% of the total marks assigned to the course. Whatever may be the total score of clearance examination, the maximum attainable grade in the clearance examination is "C".
6. A student can have a maximum of 2 (two) uncleared or carry-over courses in any semester with a cumulative maximum of 4 (four) uncleared or carry-over courses at any one semester for proceeding to the next higher semester, provided that he/she has passed in all practical/sessional courses. Such students can clear the backlog of uncleared or carry courses in the clearance/improvement examinations (the examination and grading being conducted in the

- same manner as clearance examination) of the relevant semester of lower levels than those they are currently in.
7. If the total number of un-cleared or carry courses in any semester exceeds 4 (four) for a student, he or she can proceed to the next level only after improving his or her standing by bringing down the total number of the un-cleared or carry courses within the allowable limit of 4 (four). This will cost the student at least one semester. In the mean time, the student can try to clear some of his/her un-cleared courses by taking the relevant clearance examinations. He/She can also re-register in a course previously taken by him/her and failed and attend the classes with a view to improve his learning. However, if he/she takes the quizzes and the semester final examination, the grades he/she obtains will count for calculating his/her GPA and his/her previous grade will be kept for chronological sequence. For appearing in the carry-over examinations, students are required to apply in prescribed forms available in the Examination Section of the University within due time.
8. For the purpose of grade improvement, a student obtaining a grade lower than 'B' in a course in continuous assessment plus a semester final examination can sit in the following clearance examination (which will be regarded as an 'improvement examination' for him/her) by canceling his/her earlier score on the course and banking on the likely higher score in the improvement examination. However, whatever is the total score of the improvement examination and the continuous assessment, he/she will be allowed to earn at best a 'B' for the course. Further, a student in a 4 year degree program can try to improve his/her grades in a maximum of 4 (four) courses while a B. Arch. student who goes through a 5 year program can do the same in a maximum of 5 (five) courses.
9. Re-admission: A student can re-register by a written application in the course(s), both theoretical and practical, of the previous semester he/she failed. The student may also be allowed on a written application to re-register for any or all course(s) of the semester in which he/she secured any passing grade(s) in the course(s). However, the grades in the registered course(s) will be

considered for results and Grade Point Average (GPA) and the previous grades will be recorded in the transcript/grade card only for chronological sequence. The students are required to apply in the prescribed application form available in the office of the Registrar for re-registration. The application duly filled in will be submitted to the office of the Registrar within two weeks of the commencement of the classes.

10. All 4 year degree programs at the AUST will require completion of all degree requirements within a maximum period of 7 years. The 5 year B. Arch degree program will require completion of all degree requirements within a maximum period of 8 years. Failure to complete all degree requirements within the given time frame may disqualify a student from further continuation of his study at the AUST for the degree.
11. Letter grades and the corresponding grade-points will be awarded in accordance with the provision shown below:

| NUMERICAL GRADE | LETTER GRADE | GRADE POINT |
|----------------------|--------------|-------------|
| 80% or above | A+ | 4.00 |
| 75% to less than 79% | A | 3.75 |
| 70% to less than 74% | A- | 3.50 |
| 65% to less than 69% | B+ | 3.25 |
| 60% to less than 64% | B | 3.00 |
| 55% to less than 59% | B- | 2.75 |
| 50% to less than 54% | C+ | 2.50 |
| 45% to less than 49% | C | 2.25 |
| 40% to less than 44% | D | 2.00 |
| Less than 40% | F | 0.00 |

| Extraordinary Course Status | Letter Grade |
|-----------------------------|--------------|
| Continuation | X |
| Withdrawn | W |
| Exemption | E |

NOTE:

- a) *If any grade of project and thesis of a student is not available in time due to any genuine reason, the student may apply to the Head of the Department for continuation in the subsequent semester within a week after 7th result. In this case, the student may be marked with a letter grade 'X' against the course in the tabulation sheet/grade card.*
 - b) *If a student is unable to attend the classes of a semester due to serious illness or serious accident, or financial/personal reasons, he/she may apply through the Head of the Department for withdrawal from the semester of a course/courses before the classes of the semester starts. Otherwise, he/she will have to pay the semester fees and will be declared to have failed in the subject(s). However, he/she can come back within four weeks of the start of the class and take admission for the semester, subject to the availability of seats.*
12. Each course has a certain number of credits which describes its weightage. A student's performance is measured by the number of credits that he/she has completed satisfactorily and the weighted average of the grade points (i.e. GPA) that he/she has maintained. Calculation of GPA can be explained as follows:
Suppose a student has completed five courses in a semester and obtained the following grades:

| Courses | Credits | Grades | Grade Points |
|----------|---------|--------|--------------|
| Course 1 | 3 | A+ | 4.00 |
| Course 2 | 3 | B | 3.00 |
| Course 3 | 3 | A | 3.75 |
| Course 4 | 2 | B+ | 3.25 |
| Course 5 | 1 | A- | 3.50 |

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

GPA

$$= \frac{3(4.00) + 3(3.00) + 3(3.75) + 2(3.25) + 1(3.50)}{(3 + 3 + 3 + 2 + 1)}$$

$$= 3.52$$

13. Students will be considered to be making normal progress towards a degree if their cumulative or overall GPA for all works attempted is not less than 2.20. Students who fail to maintain this minimum rate of progress may be placed on academic probation.
14. The status of academic probation is a reminder/warning to the student that satisfactory progress towards graduation is not being made. The minimum period of probation is one semester but the usual period is one academic year.
15. 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 the University. If it is the first suspension, it may be withdrawn by the concerned Head of the Department on receipt of an application from the student and on being satisfied that the student will make every effort from then on to improve his/her grade. However, a second suspension for one academic year will be regarded as final and absolute.
16. A student failing in any sessional/ practical/studio work will have to repeat the semester. While repeating a semester for the said reason, a student may be exempted from registering in the courses of the semester in which he/she scored a grade 'C' or better.
17. Full-Free Tuition Awards (FFTA) are offered to 5% of the students in every semester on the basis of the grade points earned in all of the courses (except Project and Thesis) of the immediate previous semester.
18. In addition to the above, the authority of the university also offers Half Free Tuition Awards (HFTA) to a maximum of another 5% of the students whose results are considered to be equally brilliant on submission of application in prescribed form within specified date.
19. Moreover, if two students of the same parents study in this university, one of them will get Half-Free Tuition Award (HFTA).
20. There are also provisions for financial help to the distressed Students from the fund for Welfare of the Distressed Student.
21. In addition 1% of the promoted students are awarded Full Free Tuition Award or equivalent on the recommendation of the Sponsor.
22. All the Awards are subject to good conduct & class attendance of the students concerned.
23. **Foreign Students:** Foreign students willing to get admission in any program of this university should apply through their respective embassies/high commissions. They should apply with all particulars including all credentials to assess their eligibility. Their admission will be confirmed after payment of requisite fees.

Faculty Members

| Full-Time Faculty Members, Department of Civil Engineering | | |
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| Name of the Teacher | Designation | Email |
| Dr. Engr. Abu Md. Shadullah, B. Sc. Engg. (Civil), BUET, M.S., D. Sc. (TU Dresden, Germany) | Professor and Head | headce@aust.edu deanengg@aust.edu pfshad@yahoo.com |
| Dr. Mohd. S. A. A. Kiwan, B. Sc. Engg. (Civil), Master (U.R.P.) BUET, Ph.D. (Dundee, UK) | Professor | kiwan3000@gmail.com kiwan@aust.edu |
| Dr. Md. Anwarul Mustafa, B. Sc. Engg. (Civil), Raj., M. Sc. Engg., Ph.D. (N.U. Malaysia), | Professor | anw@aust.edu jpz@bdonline.com |
| Dr. Md. Keramat Ali Molla, B. Sc. Engg. (Civil), Raj., M. Engg.(AIT, Thailand), Ph.D. (IIT, Kgp. India) | Professor | kmolla@aust.edu |
| Dr. Md. Abdul Halim. B.Sc. Engg. (Civil) BUET, M.Sc. Engg. (WRE), BUET. Ph.D. (Manchester University, UK) | | |
| Dr. Md. Mahmudur Rahman, B.Sc. Engg. (Civil) BUET, M.Engg. (AIT, Thailand), Ph.D. (Saga University, Japan) | Associate Professor | mahmudurdr@aust.edu mahmud402@yahoo.com |
| Mr. Sharmin Reza Chowdhury, B. Sc. Engg. (Civil), M. Sc., BUET, (on leave for higher study) | Assistant Professor | srchowya@yahoo.com |

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| Mr.Md. Shahid Mamun, B.Sc. Engg. (Civil), BUET, M.A.Sc. (University of Toronto, Canada). (On leave for higher study in USA) | Assistant Professor | smamun@aust.edu smamun93@hotmail.com |
| Mr. E. R. Latifee, B.Sc. Engg. (Civil), BUET, M.Sc. Engg. (Civil), (University of New Hampshire, USA). (On leave for higher study in USA) | Assistant Professor | latifee@aust.edu |
| Mr. Shaurav Zobayer Alam, B.Sc. Engg. (Civil), BUET, M.Sc. COME (Germany) (On leave for higher study in USA) | Assistant Professor | za_shaurav@aust.edu za_shaurav@yahoo.com |
| Ms. Rumana Afrin, B. Sc. Engg. (Civil), BUET, M.Sc. Engg. (Civil & Environment), BUET | Assistant Professor | rumana@aust.edu rumafrin@yahoo.com |
| Dr. Abdullah Al-Muyeed, B.Sc.Engg. (Civil), BUET, M.Sc.Engg. (Civil), BUET & Ph.D (University of Tokyo, Japan) | Assistant Professor | - |
| Ms. Nadia Sharmin, B. Sc. Engg. (Civil), BUET, (On leave for higher study in USA) | Lecturer | - |
| Mr. Md. Tohidul Islam, B.Sc. Engg. (Civil), BUET. (On leave for higher study in USA) | Lecturer | tohid@aust.edu ripon.ce@gmail.com |
| Mr. Md. Ashraf Alam, B.Sc. Engg. (Civil), BUET. (On leave for higher study in USA) | Lecturer | ashraf@aust.edu ash_ce030@yahoo.com |

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| Mr. Md. Mashfiqul Islam, B.Sc. Engg. (Civil), AUST. | Lecturer | mashfiq@aust.edu |
| Ms. Fatem-Tuz-Zahura, B.Sc. Engg. (Civil), BUET. | Lecturer | arpaammu@yahoo.com |
| Ms. Raziya Sultana Chowdhury. B.Sc. Engg. (Civil), BUET. | Lecturer | Raziyasultana.271@gmail.com |
| Mr. Md. Saiful Islam. B.Sc. Engg. (Civil), BUET. | Lecturer | Mdsaiful_slm@yahoo.com |
| Ms. Saima Islam. B.Sc. Engg. (Civil), BUET. | Lecturer | Sema21civil@gmail.com |
| Mr. Md. Fuad Hassan Khan. B.Sc. Engg. (Civil), BUET. | Lecturer | fuad_ce_buet01@yahoo.com |
| Mr. Md. Sarwar Jahan Sujan. B.Sc. Engg. (Civil), BUET. | Lecturer | - |

| Part-Time Faculty Members, Department of Civil Engineering | |
|---|---|
| Name of the Teacher | Profile |
| Prof. Dr. Harun-ur-Rashid, Ph.D. | Former Director BIT-Ctg., now CUET |
| Engr. Md. Rezaul Karim | Secretary, IEB (Civil Engg., Division) M.D., Ekushe Engineers Consultant |
| Engr. Md. Aminul Haque Shah | Former Chief Engineer Water Development Board |

Summary of Undergraduate Courses

Year-1 Semester-1

| Course No. | Course Title | Theory | Lab. | Credit |
|---------------------|--------------------------------------|--------|------|--------|
| CE 100 | Civil Engg Drawing | 0 | 3 | 1.5 |
| Phy 101 | Physics – I | 3 | 0 | 3 |
| Chem 101 | Chemistry – I | 3 | 0 | 3 |
| Chem 102 | Chemistry – Lab | 0 | 3 | 1.5 |
| CE 103 | Surveying | 4 | 0 | 4 |
| EEE 1131 | Basic Electrical Technology | 3 | 0 | 3 |
| EEE 1132 | Basic Electrical Technology – Lab | 0 | 3 | 1.5 |
| Math 101 | Mathematics – I | 3 | 0 | 3 |
| | | 16 | 9 | 20.5 |
| Total Contact Hours | | 25 | | |

| Year-1 Semester-2 | | | | |
|--------------------------|-------------------------|---------------|-------------|---------------|
| Course No. | Course Title | Theory | Lab. | Credit |
| CE 102 | Computer Aided Drafting | 0 | 3 | 1.5 |
| CE 101 | Engineering Mechanics | 4 | 0 | 4 |
| CE 104 | Practical Surveying | 0 | 3 | 1.5 |
| Math 103 | Mathematics – II | 3 | 0 | 3 |
| Hum 101 | English and Economics | 4 | 0 | 4 |
| Phy 103 | Physics – II | 3 | 0 | 3 |
| Phy 102 | Physics – Lab | 0 | 3 | 1.5 |
| | | 14 | 9 | 18.5 |
| | Total Contact Hours | 23 | | |

| Year-2 Semester-1 | | | | |
|--------------------------|------------------------------------|---------------|-------------|---------------|
| Course No. | Course Title | Theory | Lab. | Credit |
| Math 231 | Mathematics – III | 3 | 0 | 3 |
| Hum 201 | Accounting | 2 | 0 | 2 |
| CE 201 | Engineering Materials | 4 | 0 | 4 |
| CE 202 | Engineering Materials Sessional | 0 | 3 | 1.5 |
| CSE 2153 | Num. Methods & Computer Prog. | 3 | 0 | 3 |
| CSE 2163 | Num. Methods & Computer Prog – Lab | 0 | 3 | 1.5 |
| CE 211 | Mechanics of Solids – I | 3 | 0 | 3 |
| CE 212 | Mechanics of Solids Sessional | 0 | 3 | 1.5 |
| | | 15 | 9 | 19.5 |
| | Total Contact Hours | 24 | | |

| Year-2 Semester-2 | | | | |
|--------------------------|-------------------------------|---------------|-------------|---------------|
| Course No. | Course Title | Theory | Lab. | Credit |
| CE 200 | Details of Construction | 0 | 3 | 1.5 |
| CE 203 | Geology & Geomorphology | 3 | 0 | 3 |
| CE 208 | Quantity Surveying | 0 | 3 | 1.5 |
| CE 213 | Mechanics of Solids - II | 3 | 0 | 3 |
| CE 271 | Mechanics of Fluids | 4 | 0 | 4 |
| CE 272 | Mechanics of Fluids Sessional | 0 | 3 | 1.5 |
| Math 233 | Mathematics – IV | 3 | 0 | 3 |
| Hum 203 | Sociology | 2 | 0 | 2 |
| | | 15 | 9 | 19.5 |
| | Total Contact Hours | 24 | | |

| Year-3 Semester-1 | | | | |
|--------------------------|--|---------------|-------------|---------------|
| Course No. | Course Title | Theory | Lab. | Credit |
| CE 311 | Structural Analysis and Design-I | 3 | 0 | 3 |
| CE 312 | Structural Analysis & Design Sessional-I | 0 | 3 | 1.5 |
| CE 315 | Design of Concrete Structures-I | 3 | 0 | 3 |
| CE 344 | Geotechnical Engg Sessional-I | 0 | 3 | 1.5 |
| CE 331 | Environmental Engg – I | 3 | 0 | 3 |
| CE 332 | Environmental Engg Sessional-I | 0 | 3 | 1.5 |
| CE 341 | Geotechnical Engg – I | 3 | 0 | 3 |
| CE 371 | Water Resources Engg – I | 3 | 0 | 3 |
| CE 351 | Transportation Engg – I | 3 | 0 | 3 |
| | | 18 | 9 | 22.5 |
| | Total Contact Hours | 27 | | |

| Year-3 Semester-2 | | | | |
|--------------------------|---|---------------|-------------|---------------|
| Course No. | Course Title | Theory | Lab. | Credit |
| CE 313 | Structural Analysis and Design – II | 3 | 0 | 3 |
| CE 317 | Design of Concrete Structures – II | 3 | 0 | 3 |
| CE 316 | Design of Concrete Structures Sessional | 0 | 3 | 1.5 |
| CE 333 | Environmental Engg – II | 3 | 0 | 3 |
| CE 343 | Geotechnical Engg – II | 3 | 0 | 3 |
| CE 353 | Transportation Engg – II | 3 | 0 | 3 |
| CE 354 | Transportation Engg Sessional-I | 0 | 3 | 1.5 |
| CE 373 | Water Resources Engg – II | 4 | 0 | 4 |
| CE 374 | Water Resources Engg Sessional-I | 0 | 3 | 1.5 |
| | | 19 | 9 | 23.5 |
| | Total Contact Hours | 28 | | |

| Year-4 Semester-1 | | | | |
|--------------------------|---|---------------|-------------|---------------|
| Course No. | Course Title | Theory | Lab. | Credit |
| CE 400 | Project and Thesis | 0 | 6 | 3 |
| CE 401 | Construction Project Management | 3 | 0 | 3 |
| CE 411 | Structural Analysis and Design – III | 4 | 0 | 4 |
| CE 412 | Structural Analysis and Design Sessional-II | 0 | 3 | 1.5 |
| CE 415 | Prestressed Concrete | 3 | 0 | 3 |
| CE 431 | Environmental Engg – III | 3 | 0 | 3 |
| CE 432 | Environmental Engg Sessional-II | 0 | 1.5 | 0.75 |
| CE 441 | Geotechnical Engg – III | 3 | 0 | 3 |
| CE 442 | Geotechnical Engg Sessional-II | 0 | 1.5 | 0.75 |
| | | 16 | 12 | 22 |
| | Total Contact Hours | 28 | | |

| Year-4 Semester-2 | | | | |
|--------------------------|--|---------------|-------------|---------------|
| Course No. | Course Title | Theory | Lab. | Credit |
| CE 450 | Project and Thesis | 0 | 6 | 3 |
| CE 403 | Professional Practices | 2 | 0 | 2 |
| CE 413 | Structural Analysis and Design – IV (Optional) | 2 | 0 | 2 |
| CE 416 | Pre-stressed Concrete Sessional | 0 | 3 | 1.5 |
| CE 417 | Steel Structures | 3 | 0 | 3 |
| CE 418 | Computer Aided Analysis & Design of Structures | 0 | 3 | 1.5 |
| CE 419 | Introduction to Finite Element Method (Optional) | 2 | 0 | 2 |
| CE 451 | Transportation Engg – III | 3 | 0 | 3 |
| CE 452 | Transportation Engg Sessional–II | 0 | 1.5 | 0.75 |
| CE 471 | Water Resources Engg – III | 3 | 0 | 3 |
| CE 472 | Water Resources Engg Sessional–II | 0 | 1.5 | 0.75 |
| | | 13 | 15 | 20.5 |
| | Total Contact Hours | 28 | | |

| Distribution of Credits | | | | |
|--------------------------------|-----------------|---------------|-------------|---------------|
| Year | Semester | Theory | Lab. | Credit |
| 1 | 1 | 16 | 9 | 20.5 |
| 1 | 2 | 14 | 9 | 18.5 |
| 2 | 1 | 15 | 9 | 19.5 |
| 2 | 2 | 15 | 9 | 19.5 |
| 3 | 1 | 18 | 9 | 22.5 |
| 3 | 2 | 19 | 9 | 23.5 |
| 4 | 1 | 16 | 12 | 22 |
| 4 | 2 | 13 | 15 | 20.5 |
| | Total | 126 | 81 | 166.5 |

Detail Outline of Undergraduate Courses

(A) COURSES OFFERED BY THE CIVIL ENGINEERING DEPARTMENT

Year-1 Semester-1

CE 100: Civil Engineering Drawing

1.50 Credit, 3 Hrs/Week

Introduction to drawing basics; plane geometry: pentagon, hexagon, octagon, ellipse, parabola, hyperbola. Projection (Soil Geometry)-cube, triangular prism, square prism, pentagonal prism, hexagonal prism, cone, cylinder. Development-cube, pyramid, cone, prism; section and true shape-cube, pyramid, cone, prism. Isometric Drawing-cube, pyramid, cone. Oblique Drawing-cube, pyramid cone, Interpretation of Solids. Plan, elevation and section of multi-storied building & bridges.

CE 103: Surveying

4.00 Credit, 4 Hrs./Week.

Reconnaissance survey: linear measurements; traverse survey: leveling and contouring; calculation of areas and volumes; problems on heights and distances; curves and curve ranging, transition curve, vertical curves. Tachometry: introduction, principles and problems on tachometry. Astronomical surveying, definition, instruments, astronomical corrections, systems of time. Photogramtry, introduction of

terrestrial photography, aerial photography, reading of photo mosaic, scale; project surveying; errors in surveying; Geodetic survey; remote sensing; introduction to modern surveying equipment & global positioning system (GPS).

Year-1 Semester-2

CE 101: Engineering Mechanics

4.00 Credit, 4 Hrs/Week.

Units of measurements. 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 102: Computer Aided Drafting

1.50 Credit, 3 Hrs./Week

Introduction to CAD packages and computer aided drafting, drawing editing and dimensioning of simple object. Plan elevation and section of multi-storied buildings; reinforcing details of beams, slab, stairs, foundation etc. Plan, elevation and section of septic tank and water reservoir. Plan and elevation and sections of culverts and other hydraulic structures. Building services drawing.

CE 104: Practical Surveying

1.50 Credit, 3 Hrs./Week

10 days of fieldwork.

Year -2 Semester -1

CE 201: Engineering Materials

4.00 Credit, 4 Hrs./Week.

Properties of engineering materials, atomic structures and bonding, crystal structures, mechanical properties, yielding, fracture, elasticity, plasticity.

Cement, cement chemistry, manufacturing process, tests and types of cement, cement mortars; Aggregates, classification, properties, and tests of aggregates; Sand, classification, uses, sieve analysis and grading, F.M ; Bricks, classification, field test, standard laboratory tests of bricks, efflorescence; Steel, types and properties of steel.

Concrete, effect of w/c on concrete, properties of fresh and hardened concrete, concrete slump test, curing, types of concrete, admixtures, Ferrocement, Concrete mix design.

Timber, uses, classification, growth rings, defects, seasoning timber equivalent products.

Paints, varnishes, and other coating for preventing corrosion.

CE 202: Engineering 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 211: 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 center; thin walled pressure containers; riveted and welded joints.

CE 212: Mechanics of Solids 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 **of steel**; hardness test of metals; helical spring tests; determination of shear center; load deflection behavior of simple beams.

Year -2 Semester -2

CE 200: 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, roofs and stair; structural joints; pointing; plastering and interior finishing; scaffolding, formwork, staging; shoring and underpinning; thermal insulation and acoustics; House plumbing.

CE 203: 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; weathering, erosion, transportation and deposition process. Cycle of rock change; Soil formation.

Earthquake, plate tectonics and Seismic map of Bangladesh.

Structural geology; faults; types of faults; fold and fold types; domes; basins; erosional process; quantitative analysis of erosional land forms.

Geomorphology:

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 208: Quantity Surveying

1.50 Credit, 3 Hrs./Week.

Analysis of rates; use of software in quantity surveying; detailed estimate of all items of work of a building, bridge, truss. Specifications of materials for the above constructions.

CE 213: Mechanics of Solids-II

3.00 Credit, 3 Hrs./Week.

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

CE 271: 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 272: Fluid Mechanics Sessional

1.50 Credit, 3 Hrs./Week.

Center 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.

Year -3 Semester -1**CE 311: Structural Analysis and Design-I**

3.00 Credit, 3 Hrs./Week. Prereq. CE 213

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 312: Structural analysis and Design Sessional I

1.50 Credit, 3 Hrs./Week.

Analysis & design of steel structures (i.e. roof, truss & plate girder) & joint's of structure. Use of software in analysis of above structure.

CE 315 : Design of Concrete Structure-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 & shear design of beams; bond, anchorage & bar curtailment according to Code; Design of one way slabs.

CE 331: 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; had 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 332: Environmental Engineering Sessional

1.50 Credit, 3 Hrs./Week.

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

CE 341: Geo-technical Engineering-I

3.00 Credit, 3 Hrs./Week.

Introduction to Geo-technical 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; and flow-nets; stress-strain-strength characteristics of soils; compressibility and settlement behavior of soils; lateral earth pressure; stress distribution.

CE 344: Geo-technical Engineering Sessional I

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 test.

CE 351: 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 control devices, traffic studies, parking and roadway lighting; waterways and terminals.

CE 371: Water Resources Engineering-I

3.00 Credit, 3 Hrs./Week

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

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. Groundwater pollution and contaminant transport. Recharge of groundwater. Saline water intrusion in aquifers. Groundwater management.

Year -3 Semester -2

CE 313: Structural Analysis and Design-II

3.00 Credit, 3 Hrs./Week. Prereq. CE 311

Approximate analysis for vertical loading, approximate analysis for Lateral loading, Earthquake load calculation as per BNBC; approximate analysis of statically indeterminate structures, portal frames, mill bent and multi storied building frames; deflection of beams, trusses and frames by virtual work method (method of consistent deformation).

CE 316: Design of Concrete Structure Sessional

1.50 Credit, 3 Hrs./Week.

Analysis and design problems based on CE 315; design of a slab bridge, simple girder bridge and a low-rise building (for example one storied brick wall supported building).

CE 317: Design of Concrete Structures-II

3.00 Credit, 3 Hrs./Week. Prereq. CE 315

Review of Codes; Two-way Slabs; columns; footings; retaining walls, reinforced concrete floor and roof systems. Yield line method; introduction to pre-stressed concrete. Analysis and preliminary design of pre-stressed beam section.

CE 333: Environmental Engineering-II

3.00 Credit, 3 Hrs./Week.

Wastewater Engineering: introduction; water supply, sanitation and health; estimation of wastewater collection systems; hydraulics of sewer; design, construction and maintenance of sanitary sewer and storm drainages 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 343: Geotechnical Engineering-II

3.00 Credit, 3 Hrs./Week.

Soil investigation techniques; settlement computations; types of foundations; bearing capacity of shallow and deep foundations; settlement and distortion of foundations; design and construction of shallow foundations, rafts, piles; stability of slopes.

CE 353: Transportation Engineering-II: Highway Design & Railways

3.00 Credit, 3 Hrs./Week.

Highway materials; sub-grade, sub-base 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; equipment; railways: general requirements, alignment, permanent way, station and yards, signaling, points and crossings, maintenance.

CE 354: Transportation Engineering Sessional

1.50 Credit, 3 Hrs./Week.

Tests on bituminous materials, test on sub-grade, sub-base and base materials; mix design; roadway capacity studies; simulation of statistical packages.

CE 373: Water Resource Engineering-II

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 374: Water Resources Engineering Sessional

1.50 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.

Year -4 Semester -1

CE 400: Project and Thesis

3.00 Credit, 3 Hrs./Week

Experimental and theoretical investigation of various topics in structural engineering, concrete technology, environmental engineering, transportation engineering and Geo-technical engineering Water Resources Engineering. Individual or group study of one or more topics from any of the above fields. Each student will be required to submit a thesis/project report at the end of the work.

CE 401: Construction Project Management

2.00 Credit, 2 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. Introduction of software in project management (e.g. Microsoft Project)

CE 411: Structural Analysis and Design-III

4.00 Credit, 4 Hrs./Week. Prereq. CE 313

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

CE 412: 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 with the aid of software.

CE 415: Pre-stressed Concrete

3.00 Credit, 3 Hrs./Week

Pre-stressed concretes: materials; pre-stressing systems; loss of pre-stress; analysis of sections for flexure, shear, bond and bearing; beam deflections and cable layout; partial pre-stress.

Design of pre-stressed sections for flexure, shear, bond and bearing.

CE 431: Environmental Engineering-III

3.00 Credit, 3 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. Environment Pollution and its Control: water pollution; industrial pollution; Air pollution and Global warming.

Environment and Development Project: environmental policies and legislation; baseline studies.

CE 432: Environmental Engineering Sessional II

1.50 Credit, 3 Hrs./Alternate week

Design of water & waste water treatment plants; design of water supply & sewerage system; Field visit and reporting.

CE 441: Geo-technical Engineering-III

3.00 Credit, 3 Hrs./Week

Foundation for structures subjected to lateral loads retaining walls and abutments; operation and methods of construction, dewatering and slurry construction.

Flexible earth retaining structures, sheet piles, cofferdams, caissons; machine foundations-elementary vibrations, shear modulus and elastic constants, foundations design for vibration, fundamentals of soil liquefaction.

Soil improvement by various methods, Effective stress & pore pressure co-efficient.; Introduction to earthquake and soil liquefaction problems.

CE 442: Geo-technical Engineering- Lab II

1.50 Credit, 3 Hrs./Alternative week

Interpretation of soil test results and design of foundations.

Year -4 Semester -2

CE 450: Project and Thesis

3 Credit, 3 Hrs./Week

Experimental and theoretical investigation of various topics in structural engineering, concrete technology, environmental engineering, transportation engineering and Geotechnical engineering Water Resources Engineering, Individual or group study of one or more topics from any of the above fields. Each student will be required to submit a thesis/project report at the end of the work.

CE 403: Professional Practices

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 labor relations; professional ethics in Civil Engineering.

Economic environmental & institutional aspects of land & water management. System Analysis approach. Participation of beneficiaries. Operation and maintenance of civil engineering project.

CE 413: Structural Analysis and Design-IV

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 non-circular shafts; instability of structures; stability functions. 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 416: Pre-stressed concrete sessional

1.50 Credit, 3 Hrs./Week

Design of various reinforced concrete structures, e.g. post-tensioned flat slab, post-tensioned beams, pre-tensioned concrete piles and circular pre-stressing.

CE 417: Design of Steel Structures

3.00 Credit, 3 Hrs./Week

Behavior of structural steel members and steel frames; code requirements; design of tension and compression members by ASD and LRFD methods; design of beam, beam-columns; Joint design.

CE 418: Computer aided analysis & design of structures

1.50 Credit, 3 Hrs./Week

Design of various reinforced concrete structures, e.g. water tower, rigid frame bridge, folded plate roof using software packages.

CE 419: 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 problems. Two dimensional plane stress & plane strain analysis of stress deformation problems.

CE 451: Transportation Engineering-III: Traffic Planning Management

3.00 Credit, 3 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.

Highway planning, evaluation and analysis of transportation projects, implementation of transportation project.

Traffic Engineering administration and legislation; urban public transportation and freight movement.

CE 452: Transportation Engineering Sessional II

1.50 Credit, 3 Hrs./Alternate week

Design of rigid and flexible highway and air field pavements; geometric design: Roadway intersections capacity calculations; traffic studies and design.

CE 471: Water Resources Engineering-III

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. Behavior of Alluvial river training and bank protection work.

CE 472: Water Resources Engineering Sessional II

1.50 Credit, 3 Hrs./Alternate 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 a drainage canal network. Pumps in series and parallel. Pump characteristics. Flow through canal regulating structures.

**(B) COURSES OFFERED BY OTHER DEPARTMENTS TO THE
CIVIL ENGINEERING DEPARTMENT**

Year -1 Semester -1

Phy 101: Physics-I

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's bi-prism, Newton's ring, interferometer, Diffraction of light: Fresnel and Fraunhofer diffraction, diffraction by single slit, diffraction by double slit, diffraction gratings, polarization, production and analysis of polarized light, optical activity, optics of crystal.

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, kinetic interpretation of temperature, equipartition of energy and calculation of ratio specific heats, mean free path, Vander Wall's 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, traveling and standing waves, intensity of 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.

39

Chem 101: Chemistry-I

3.00 Credit, 3 Hrs./Week

Reaction 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 solutions: 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 metals 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.

Chem 102: Chemistry-I Lab

1.5 Credit, 3 Hrs./Week

Laboratory experiments based on Chem 101.

Math 101: Mathematics-I

3.00 Credit, 3 Hrs./Week

Differential Calculus:

Limit, Continuity and differentiability. n-th derivatives of standard functions. Leibnit's theorem. Rolle's theorem, Mean value theorem. Expansion infinite and infinite forms. Indeterminate form.

40

Partial differentiation. Euler's theorem. Tangent and Normal. Sub-tangent 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. Gamma function. Multiple integrals. Area, Volume of solid of revolution.

EEE 1131: Basic Electrical Technology

3.00 Credit, 3 Hrs./Week

DC Circuits:

Electrical units and standards. Electrical networks and circuit solution: Series, Parallel and Mesh current methods. Measurement of electrical quantities current, voltage, resistance. Measuring instruments; ammeters, voltmeters, watt meters and multimeters.

AC Circuits:

Instantaneous current, voltage and power, effective current and voltage, average power; Phasor algebra; Introduction to electrical wiring for residential and commercial loads.

Electrical Machines:

Familiarization with different types of electrical machine such as DC generators and motors. A.C. alternators, motors, transformers. Working principles of transformers, induction motors. Introduction to electronics principles with simple applications.

EEE 1132: Basic Electrical Technology Lab

1.5 Credit, 3 Hrs./Week

Lab. experiments based on theory and concepts learnt in EEE 1131.

41

Year -1 Semester -2

Math 103: Mathematics-II: Coordinate Geometry and Matrices:

3.00 Credit, 3 Hrs./Week

System of coordinates. Projection. Direction Cosines. Equations of planes and lines. Angles between lines and planes. Distance from a point to a plane. Co-planer lines. Shortest distance between two given straight lines. Standard equations of conicoids; spheres; ellipsoids. Hyperboloid of one sheet. Hyperboloid of two sheets. Tangent planes. Normal lines. Condition of tangency.

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, Matrix polynomials, Determination of characteristic root & vectors, null space and nullity of matrix. Characteristic subspace of matrix.

Phy 103: Physics-II Structure of matter, Electricity and magnetism and Modern physics.

3.00 Credit, 3 Hrs./Week. Prereq. Phy. 101.

Structure of 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 Walls, covalent and ionic bond, packing in solids, inter-atomic distances and forces of equilibrium, x-ray diffraction; Bragg's law

Electricity & Magnetism: Electric charge, Coulomb's law. The electric field, calculation of the electric field strength, 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, Capacitor's; capacitance, dielectrics: an atomic view, dielectrics and Gauss's law.

42

Current and resistance: current and current resistance: 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, classification of magnetic materials, magnetization 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's wave, Bohr's atom model, Radioactive decay, half life, mean life, isotopes, nuclear binding energy, alpha, beta, gamma decay.

Phy 102: Physics-I Lab

1.5 Credit, 3 Hrs./Week

Laboratory experiments based on Phy 101 & Phy 103.

Hum 101: English & Economics

4.00 Credit, 4 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. Precise writing. Report. Commercial correspondence and tenders. Short stories written by some well known classic writers.

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 diseconomics.

43

Macro-economics: Savings, investment. National, income analysis. Inflation. Monetary policy, Fiscal policy and Trade policy with reference to Bangladesh. Planning in Bangladesh. Im going out now

Year -2 Semester -1

Math 231: Mathematics-III

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.

Hum 201 : Accounting

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, cooperative and socialist movements. Rural sociology.

44

Principles of accounting: accounts, transaction, 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.

CSE 2153: Numerical Methods and Computer Programming

3.00 Credit, 3 Hrs./Week

Basic components of computer system; FORTRAN/C Language; numerical solution of algebraic and transcendental equations; matrices; solution of systems of linear equations; curve-fitting by least squares; finite difference; divided differences; interpolation; computer applications to Civil Engineering problems, numerical differentiation and integration; numerical solution of differential equations.

CSE 2163: Numerical Methods & Comp. Progr. Lab

1.50 Credit, 3 Hrs./Week

Operating system for microcomputers; development of FORTRAN/C programs and solution of problems using a computer, solution of Civil Engineering problems using microcomputers.

45

Year -2 Semester -2

Math 233 : Mathematics – IV: 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. Applications 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, Stroke'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, poisson and negative binomial. Continuous probability distribution, e.g., normal and exponential. Characteristics of distributions. Elementary sampling theory. Estimation. Hypothesis testing and regression analysis.

Hum 203 : 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, cooperative and socialist movements. Rural sociology.

46

**COURSES OFFERED BY THE CIVIL ENGG DEPT TO
OTHER DEPARTMENTS**

Department of Architecture:

Arc 2129: Structure and Architecture-I

(Analytic Mechanics)

2hrs/week: 2 credits

Force; equilibrium; free-body diagrams; resultants and components; coplanar concurrent forces; moments and parallel coplanar forces; centroid; moment of inertia of areas; maximum and minimum forces; friction; flexible chords;

Arc 2225: Building Sciences & Services-II, Plumbing

2hrs/week: 2 credits

Introduction; water requirements; water sources; water supply and distribution in building; sewage and sewer system; building sewer and drainage system; septic tank; sewage disposal; plumbing of multistoried building

Arc 2229: Structure and Architecture-II

(Fundamentals of stress and strain in structures)

2hrs/week: 2 credits

Fundamentals of strength of materials; types of stress and failures; the concept of factors of safety; shear and bending moments in beams; stress and deflections in beams; fundamentals of columns.

Arc 3129: Structure and Architecture-III

(Reinforced Concrete - I)

2hrs/week: 2 credits

Fundamentals of RCC design; working stress design method; analysis of reinforced beams by WSD method; design of slabs: one-way and two-way slabs, flat slabs; design of columns.

Arc 3157: Project Management -I

(Surveying Techniques)

2hrs/week: 2 credits

Introduction to surveying; principles and techniques of physical surveys; chain survey; traverse survey; plane table survey; levels and leveling; contours and layout surveys; Research and its types; design and plan of research; purpose and goal; selection of methods; design of questionnaire; pre-testing; pilot survey; collection and filing of data; data processing.

Arc 3158: Project Management Sessional - I

(Surveying Techniques)

3hrs/week: 1.5 credits

Practical surveying.

Arc 3229: Structure and Architecture-IV

(Reinforced Concrete II)

2hrs/week: 2 credits

Soil Mechanics and Foundation Engineering: Design of foundations; RCC footings, piles, rafts, retaining walls. Concept of structural indeterminacy and its application in structural system development.

**Arc 4129: Structure and Architecture-V
(Pre-stressed Concrete and Steel Structures)**

2hrs/week: 2 credits

Introduction to pre-stressed concrete design; design and pre-stressing of simple building elements. Truss: different types of trusses; wind and static load analysis of trusses; design of truss sections. Design of steel beams and columns.

**Arc 4229: Structure and Architecture-VI
(Structural Systems)**

2hrs/week: 2 credits

Synthesis of force systems as determinant of structural systems; shells and folded plates; virendeal trusses; space structures; high-rise and large span structures. Pre-stressing and post-tensioning.

Department of Computer Science and Engineering:

ME 104: Engineering Drawing - I

3hrs/alt. week: 0.75 credits

Introduction; Instruments and their uses; First and third angle projections; Orthographic drawings; Isometric views; Missing lines and views; Sectional views and conventional practices; Auxiliary views.

Department of Electrical and Electronic Engineering:

CE 1202: Engineering Drawing

3 hrs/ week: 1.5 credits

Introduction; Instruments and their uses; First and third angle projections; Orthographic drawings; Isometric views; Missing lines and views; Sectional views and conventional practices; Auxiliary views.

CE 1201: Mechanics of Materials

3hrs/week: 3 credits

Concepts of stress and strain; Stresses in members subjected to tension, compression, shear, and temperature changes; Bending moments and shear force diagrams; Flexural and shear stresses in beams; Tensional stresses in shafts; Helical springs; Thin and thick cylinders; principal stresses; Deflection of beams; Columns.

Department of Textile Technology:

ME 102: Engineering Drawing

3hrs/ week: 1.5 credits

Introduction to lettering, numbering and heading; plane geometry-pentagon, hexagon, octagon, ellipse, parabola, hyperbola. Projection (Soil Geometry)-cube, triangular prism, square prism, pentagonal prism, hexagonal prism, cone, cylinder. Development-cube, pyramid, cone, prism; section and true shape-cube, pyramid, cone, prism. Isometric Drawing-cube, pyramid, cone. Oblique Drawing-cube, pyramid cone, Interpretation of Solids.