



আন্তর্জাতিক ইসলামী বিশ্ববিদ্যালয় চট্টগ্রাম  
الجامعة الإسلامية العالمية شيتاغونغ  
**International Islamic University Chittagong**  
**Department of Civil of Engineering (CE), FSE**



**Syllabus for Undergraduate Study for Fours (4) Years  
Bachelor of Science in Civil Engineering (CE)**

**Department of Civil Engineering,  
Faculty of Science and Engineering,  
International Islamic University Chittagong**

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## Contents

<b>Chapter 1: The Mission, Vision, Objectives and Motto of IIUC</b>		
1.1	Introduction	
1.2	The Mission of the University	
1.3	The Vision of the University	
1.4	The objective of the University	
1.5	The Motto of the University	
<b>Chapter 2: Teaching Methods and Policy</b>		
2.1	Methods	
2.2	Policy	
2.3	Morality Development Program	
2.4	Co-Curricular and Extra-curricular activities	
2.5	Student Advisor	
<b>Chapter 3: Mission and Objectives</b>		
3.1	Methods	
3.2	The Mission of the Faculty of Science and Engineering is as follows	
<b>Chapter 4: The Program Outcomes</b>		
4.1	Program educational outcome (PEO)	
4.2	Program learning outcome (PLO)	
<b>Chapter 5: The CE Program Educational Objectives</b>		
5.1	Objective 1	
5.2	Objective 2	
5.3	Objective 3	
<b>Chapter 6: Duration of Program</b>		
<b>Chapter 7: Course Identification Plan</b>		
<b>Chapter 8: Marks distribution for projects/thesis Evaluation</b>		



<b>Chapter 9: Awarding marks for attendance</b>		
<b>Chapter 10: Admission Requirements</b>		
<b>Chapter 11: Other Requirements</b>		
<b>Chapter 12: The Credit Hour System at IIUC</b>		
<b>Chapter 13: Grading System</b>		
<b>Chapter 14: Grade Point and Cumulative grade point</b>		
<b>14.1</b>	<b>Grade Point Average (GPA)</b>	
<b>14.2</b>	<b>Cumulative grade point Average (CGPA)</b>	
<b>Chapter 15: Earned Credit</b>		
<b>Chapter 16: Course Requirement for Undergraduate program</b>		
<b>16.1</b>	<b>Introduction</b>	
<b>16.2</b>	<b>Civil Engineering curriculum as per UGC standard syllabus guidelines</b>	
	<b>A</b>	<b>Pre-Requisite Courses of University Requirement</b>
	<b>B</b>	<b>Courses of main curriculum of Civil Engineering Degree</b>
<b>16.3</b>	<b>Titles, Codes, Credit hours and Contact hour of the Courses.</b>	
	<b>A</b>	<b>Pre-requisite Courses of University Requirement</b>
	<b>B</b>	<b>Categories of courses in Civil Engineering as per UGC Guidelines</b>
	<b>B1</b>	<b>Languages and Interdisciplinary Courses</b>
	<b>B2</b>	<b>Basic Sciences</b>
	<b>B3</b>	<b>Mathematics</b>



	B	B4	Other Engineering	
		B5	Basic Engineering	
		B6	Structural Engineering	
		B7	Environmental Engineering	
		B8	Geotechnical Engineering	
		B9	Transportation Engineering	
		B10	Water Resources Engineering	
		B11	Other Sessional	
		B12	Civil Engineering practices	
		B13	Project Thesis & Viva Voce	
		B14	Technical Electives/ Optional	
16.4	Semester wise list of Courses			
16.5	Option of elective courses			

<b>Chapter 17: Semester wise Summary of Courses</b>				
17.1	Grade Point Average (GPA)			
17.2	Cumulative grade point Average (CGPA)			

<b>Chapter 18: Semester wise Summary of Courses</b>				
18.1	FIRST SEMESTER			
18.2	SECOND SEMESTER			
18.3	THIRD SEMESTER			
18.4	FOURTH SEMESTER			
18.5	FIFTH SEMESTER			
18.6	SIXTH SEMESTER			



<b>Chapter 18: Semester wise Summary of Courses(Contd.)</b>		
18.7	<b>SEVENTH SEMESTER</b>	
18.8	<b>EIGHTH SEMESTER</b>	

<b>Chapter 19: Semester wise Summary of Courses: OPTIONAL</b>		
19.1	<b>Option I- Structural Engineering</b>	
19.2	<b>Option II Geotechnical Engineering</b>	
19.3	<b>Option III Transportation Engineering</b>	
19.4	<b>Option-IV Environmental Engineering</b>	
19.5	<b>Option V Water Resources Engineering</b>	



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<b>Chapter 1: The Mission, Vision, Objectives and Motto of IIUC</b>		
<b>1.1</b>	<b>Introduction</b>	
<b>1.2</b>	<b>The Mission of the University</b>	
<b>1.3</b>	<b>The Vision of the University</b>	
<b>1.4</b>	<b>The objective of the University</b>	
<b>1.5</b>	<b>The Motto of the University</b>	



## 1. The Mission, Vision, Objectives and Motto of University

### 1.1 Introduction

International Islamic University Chittagong (IIUC) is one of the top graded government approved private universities in Bangladesh. Having fulfilled the requirements as laid down in the Private University Act of 1992, and after obtaining the necessary clearance from University Grants Commission (UGC), and the permission of Government of Bangladesh (GOB) through the Ministry of Education, **International Islamic University Chittagong (IIUC)** started functioning on **February 11, 1995**. The credit for the idea of establishing this University goes to International Islamic University Chittagong Trust (IIUCT).

IIUC framed its own Statutes, Ordinances and Regulations governing the manifold activities of IIUC - academic, administrative, financial, student welfare, discipline etc. as per the **Private University Act, 1992, 1998 and revised Act, 2010**. Most statutory bodies formed under the provisions of the Act have since then been functioning.

### 1.2 The Mission of the University

The mission is to produce through the pursuit of education properly trained up manpower to contribute to socio-economic development and moral upliftment of the society and to cultivate in our students expertise as well as ethical sensitivity, intelligence and an ability to think independently beyond their areas of study, so that they can sustain justice in all walks of life.

### 1.3 The Vision of the University

**The vision** is to offer nationally competitive and internationally recognized opportunities for learning to make this University as the Centre of Excellence in different areas of scholarship, like Shari'ah and Islamic Studies, Business Studies, Social Science, Science & Engineering, Arts & Humanities, Law, and such other faculties that will be introduced in future. Its door is open to the admission seekers from all over the world, regardless of race, region and religion. This university cherishes the dream of becoming one of the highest seat of learning and creator of knowledge in the South East Asia.

### 1.4 The objective of the University

- a. To create a new generation of competent youths, who will be equipped with academic excellence, professional expertise and adorned with moral height.
- b. To follow a policy of continued Modernization of Knowledge and academic curricula in different disciplines of education so that its students can imbibe the true spirit of religious as an effective guiding principle in their profession and daily life.

### 1.5 The Motto of the University is to “Combine Quality with Morality”.



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**International Islamic University Chittagong**  
**Department of Civil of Engineering (CE), FSE**



<b>Chapter 2: Teaching Methods and Policy</b>		
<b>2.1</b>	<b>Methods</b>	
<b>2.2</b>	<b>Policy</b>	
<b>2.3</b>	<b>Morality Development Program</b>	
<b>2.4</b>	<b>Co-Curricular and Extra-curricular activities</b>	
<b>2.5</b>	<b>Student Advisor</b>	



## 2. Teaching Methods and Policy

### 2.1 Methods

Outcome-based education (OBE) and Bi- Semester system of Continuous Quality Improvement (CQI) through self-examination and external review.

In this process, students are evaluated throughout a course of study rather than exclusively by examination at the end. It is multidimensional based on students -

- a) Attendance in the Classes;
- b) Performance in Assignments and Class Tests ,
- c) Scores in the Mid-Term and the Final Examination
- d) Lab. Reports,
- e) Thesis/ Project/ internship,
- f) Presentations
- g) Viva-voce,
- h) Industry visits
- i) Co-Curricular and Extra-curricular activities.

### 2.2 Policy

The University is committed to the life-long success of students in its undergraduate and master's programs through high-quality instruction and learning experiences. IIUC has **Integrated Education** Policy, where a student achieves holistic learning through awareness of his surroundings and other relevant knowledge bases. IIUC emphasizes the diffusion of scientific, technical and professional knowledge on the one hand, & building up of character in youth by making religion and ethics an integral part of education on the other. In this regard, there are some courses for the students of all Faculties at IIUC, *which are not a part of the main curriculum of the Departments*, but those are named as University Requirement Courses (URC).

### 2.3 Morality Development Program

IIUC incorporates studies on the values of mutual respect & peaceful co-existence in the courses under the “**Morality Development Program (MDP)**” which includes all students of the university irrespective of caste, creed or religion.



#### 2.4 Co-Curricular and Extra-curricular activities

IIUC supports student participation in a broad array of *Co-Curricular and Extra-curricular activities* as an integral component of its commitment to student life and success. These programs mainly includes leadership training, cultural, environmental, recreational and social activities, debating & public speaking programs, intellectual discussions, games & sports, excursion and study tours home & abroad to complement academic pursuits. By these programs students earn capacity to express out themselves properly, maintain personality and learn to respect people of other faiths through mutual understandings among various regions, religions, beliefs and cultures. All *Co and Extra-curricular* activities are run by the clubs named after the Departments such as Computer club, Business club etc under the close supervision and monitoring of Students Affairs Division (STAD).

#### 2.5 Student Advisor

IIUC provides academic counseling, career and student welfare counseling by the **Student Advisor** of the respective section of students of each **Semester**.



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<b>Chapter 3: Mission and Objectives</b>		
<b>3.1</b>	<b>Methods</b>	
<b>3.2</b>	<b>The Mission of the Faculty of Science and Engineering is as follows</b>	



### 3. Mission and Objectives

#### 3.1 The Mission of the Faculty of Science and Engineering is as follows

Through education, research, and service, IIUC will prepare graduates to integrate their expertise as engineers and technologists with cultural understanding and with moral height to improve life in the region and the world.

#### 3.2 The Mission and Objectives of the Civil Engineering Department/ Program

The Civil Engineering Department's program mission and goal of the department are as follows:

“**The principal mission** of the Civil Engineering program is to offer the strong academic program needed to produce well-educated students who can become productive members of the Civil Engineering profession. This mission is consistent with the academic component of the University's mission, which is in part to provide a strong academic program in engineering.”

“**The Objective of** the undergraduate Civil Engineering program is to instill in IIUC graduates the knowledge, skills, attitude, and ethical values necessary to be successful practitioners who are able to impart positive social impacts at the state, regional, national, and international levels. Additionally, IIUC seek to provide the necessary academic background for Civil Engineering graduates pursuing advanced degrees.”



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<b>Chapter 4: The Program Outcomes</b>		
<b>4.1</b>	<b>Program educational outcome (PEO)</b>	
<b>4.2</b>	<b>Program learning outcome (PLO)</b>	



#### 4. The Program Educational/ Learning Objectives/ Outcomes (PEO/ PLO)

The Objectives of the undergraduate program in Civil Engineering (CE) is to provide the strong academic training needed for students to become educated members of society who can both join and make significant contributions to the Civil Engineering profession.

<b>4.2 Program Learning Outcome (PLO)</b>	
Students graduated from the Faculty of Science and Engineering programmes should have the ability to:	
<b>1</b>	<b>Engineering Knowledge (T)</b> - Apply knowledge of mathematics, sciences, engineering fundamentals and an engineering specialization to the solution of complex engineering problems;
<b>2</b>	<b>Problem Analysis (T)</b> – Identify, formulate, research relevant literature and analyze complex engineering problems, and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences;
<b>3</b>	<b>Design/Development of Solutions (A)</b> – Design solutions, exhibiting innovativeness, for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, economical, ethical, environmental and sustainability issues;
<b>4</b>	<b>Investigation (D)</b> - Conduct investigation into complex problems, displaying creativeness, using research-based knowledge, and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions
<b>5</b>	<b>Modern Tool Usage (A &amp; D)</b> - Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities, with an understanding of the limitations;
<b>6</b>	<b>The Engineer and Society (ESSE)</b> - Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems;
<b>7</b>	<b>Environment and Sustainability (ESSE)</b> - Understand and evaluate the sustainability and impact of professional engineering work in the solutions of complex engineering problems in societal and environmental contexts;
<b>8</b>	<b>Ethics (ESSE)</b> – Apply professional ethics with Islamic values and commit to responsibilities and norms of professional engineering code of practices;
<b>9</b>	<b>Communication (S)</b> - Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;
<b>10</b>	<b>Individual and Team Work (S)</b> - Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings;



11	<b>Life Long Learning (S)</b> - Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change
12	<b>Project Management and Finance (S)</b> - Demonstrate knowledge and understanding of engineering management and financial principles and apply these to one's own work, as a member and/or leader in a team, to manage projects in multidisciplinary settings, and identify opportunities of entrepreneurship.



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<b>Chapter 5: The CE Program Educational Objectives</b>		
5.1	Objective 1	
5.2	Objective 2	
5.3	Objective 3	



## 5. The CE Program Educational Objectives

Which describe the professional accomplishments that graduates should achieve in various stages of professional career, and their associated Program Outcomes are as follows:

### 5.1 Objective 1 –

**Graduates should demonstrate the ability for early career professional growth based on their grasp of fundamental concepts in civil engineering.**

*Within the first few years after graduation, CE graduates should be employed by an organization that serves the profession or enrolled in postgraduate studies. They should be participating in engineering practice based on their academic foundation.*

**Objective 1** is associated with following **Program (Learning) Outcomes:**

- a) An ability to apply knowledge of math, science, engineering;
- b) An ability to design and conduct experiments and analyze data.
- c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, political, environmental, social, ethical, health and , manufacturability, and sustainability.
- d) An ability to identify, formulate, and solve engineering problems.
- e) An ability to use the techniques, skills, & modern engineering tools necessary for engineering practice.

### 5.2 Objective 2 –

**Graduates should utilize knowledge and skills to participate in civil engineering design and/or management processes.**

*About five years beyond graduation, Civil Engineering graduates should be participating effectively in design processes and developing civil engineering solutions within a team setting. They are expected to be engaged in management and leadership roles for civil engineering projects and to assume positions of greater responsibility to the profession and public.*

**Objective 2** is associated with following **Program Outcomes:**

- a) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, political, environmental, social, ethical, health and, manufacturability, and sustainability.
- b) an ability to function on multi-disciplinary teams
- c) an ability to professional and ethical responsibility
- d) an ability to Communicate effectively
- e) a knowledge of contemporary issues.



### 5.3 Objective 3 –

**Graduates should develop professionally through a commitment to life-long learning.**

*At all stages, CE graduates should exhibit their potential for a sustained productive career through life-long learning. They should continue the professional registration process if necessitated by employment.*

**Objective 3** is associated with following **Program Outcomes**:

- a) an ability to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- b) a recognition of the need for, and an ability to engage in **Life-Long Learning**
- c) a knowledge of contemporary issues



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<b>Chapter 6: Duration of Program</b>	
<b>Chapter 7: Course Identification Plan</b>	
<b>Chapter 8: Marks distribution for projects/thesis Evaluation</b>	
<b>Chapter 9: Awarding marks for attendance</b>	

## 6. Duration of program

In order to complete the B. Sc. Engineering in Civil Engineering (CE) program at the International Islamic University Chittagong, normally takes four academic years (i.e.8 Semesters). Each academic year is divided into 2 Semesters (Spring Semester: January-June and Autumn Semester: July -December), each having a duration of **15 class weeks**. The duration of theory classes shall be of 60 minutes. One unit of theory (1T) is normally 3 credit hours and 3 contact hours. One unit of Laboratory (1L) is 1.5 credit hours and 3 contact hours. Marks of 3 Credit hours course is 100 marks. There shall be assignments, class tests, mid-term, final exam, thesis/ project/ internship, presentations, viva-voce, industry visits, co-curricular and extra-curricular activities

Each theory course carries 100 marks of which 10 marks for class tests/assignments/oral tests ( at least one assignment and one class test before Mid-term and also after Mid-term) , 10 marks for attendance, 30 marks for mid-term examination and 50 marks for the final examination. Sessional course also carries 100 marks of which 50 marks allotted for running assessment and 50 marks for practical exam, viva, quiz etc at the end of semester final examination.

**The Mid-term Examination will be held after conducting 6 weeks classes. After Mid-term Examination and conducting of 9 weeks classes Final Examination will be held at the end of each semester. The student will have to take total 163 credit hours [7 credit hours (4.1%) as Pre-requisite Courses of University Requirement and 156 credit hours (95.9%) for main curriculum courses of Civil Engineering Degree] and completed by a student during 8 semesters. A student may be allowed to complete his/her graduation studies in the University within maximum six academic years (i.e.12 semesters). The University Requirement Courses (URC) are not a part of the main curriculum of the department.**



## 7. Course Identification Plan

Following code plan (refer to Figure 1) has been adapted for course identification: First digit stands for Year, the Second digit stands for Semester, the Third digit stands for Group & the Fourth digit stands for the course number (odd number has been assigned to theory course and the even number has been assigned to seasonal course).

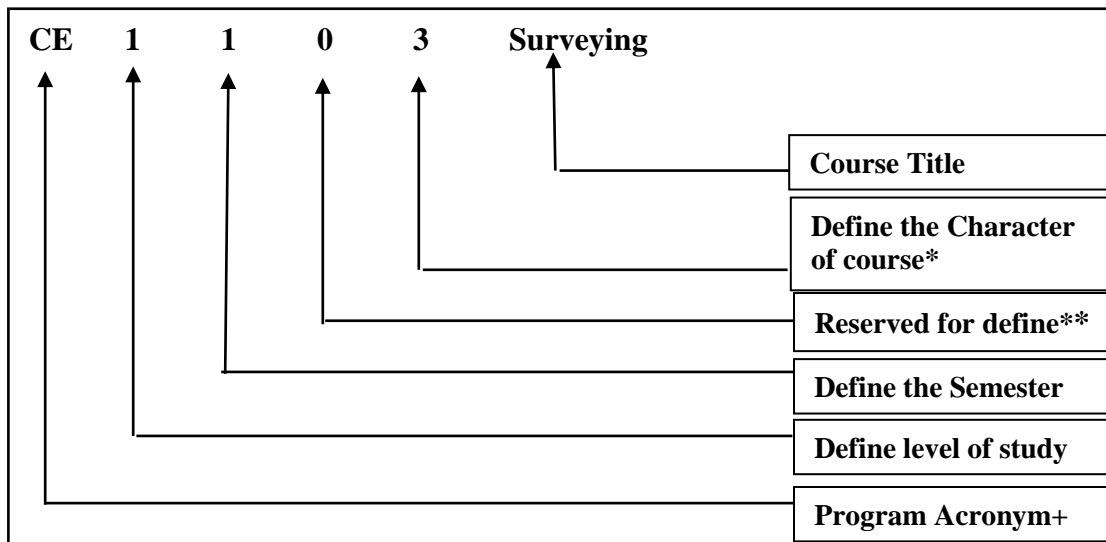


Figure 1: Define Code Plan (Note: \*odd number for Theoretical courses and even for sessional courses; \*\* reserved by the department for further use; +Civil Engineering)

## 8. Marks distribution for projects/thesis Evaluation

(Refer to UGC suggestion in Table 1)

- 1) Project/Thesis evaluation by Supervisor- 40%
  - 2) Project/Thesis evaluation by Examiner- 30%
  - 3) Project/thesis presentation and defense- 30%
- Total = 100%

**Table 1: Project and or thesis evaluation as per UGC, Bangladesh**



## 9. Awarding marks for attendance

Attendance	Awarding 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

**Table 2. Basis for Awarding marks for attendance as UGC**



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<b>Chapter 10: Admission Requirements</b>	
<b>Chapter 11: Other Requirements</b>	

## 10. Admission Requirements

<p>Admission at IIUC is purely on the basis of merit. Furthermore, admission to the available programs depends on the type and level of the program that a candidate wishes to pursue.</p> <p>The general academic qualifications for the admission to first year Bachelor of Engineering in Civil Engineering.</p>	
i	<p>For SSC/ Dakhil, and HSC/ Alim (Science Group) system the minimum shall be (SSC GPA) +(HSC GPA ) = 6.50. (But score of less than GPA 2.5 in any individual examination is not acceptable). An applicant must submit his/ her results during the application. Provisional admission for appeared students should not be allowed.</p>
ii	<p>For 'O' level &amp;'A' level system an applicant must have completed 6 papers in 'O'level and 6 papers in 'A'level, in the 'A' level the; student must have completed at least 2 papers of Physics, 2 papers of Chemistry and 2 papers of Mathematics. Minimum average GPA of combined 'O' level 'A' &amp;level shall be 'C' an applicant must submit his results during the application. Provisional admission for appeared students should not be allowed.</p>
iii	<p>For applicants from foreign countries similar standard should be maintained. The applicant must have completed Physics, Chemistry and Mathematics in the 12th level;</p>
iv	<p>English is the primary languages used as the medium of instruction in the University.</p>

## 11. Other Requirements

Admission to IIUC is always through a competitive Admission Test (written and oral). All applicants are required to undergo the process to qualify for admission into different programs of study. However, sound health, good character and financial capability to carry on the entire program are also taken into consideration.



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<b>Chapter 12: The Credit Hour System at IIUC</b>		
<b>Chapter 13: Grading System</b>		
<b>Chapter 14: Grade Point and Cumulative grade point</b>		
<b>14.1</b>	<b>Grade Point Average (GPA)</b>	
<b>14.2</b>	<b>Cumulative grade point Average (CGPA)</b>	
<b>Chapter 15: Earned Credit</b>		



## 12. The Credit Hour System at IIUC

To bring the academic system to international standard, IIUC follows Open Credit Hour System (OCHS) based on a quantified curriculum, whereby a certain number of credit hours are assigned to each course. Students are required to complete successfully the total number of credit hours stipulated in the program requirements in order to graduate. The number of credit hours assigned to each course denotes the academic load that a student carries while registering for that course. Therefore, a course that carries three credit hours normally has three contact hours per week.

## 13. Grading System

The Grading System for assessing the performance of the students shall be as follows (refer to Table 3):

Numerical Marks%	grade	Letter Grade (LG)	Grade Point (GP/unit)	Remarks/Status
80-100		A+ (A plus)	4.00	Excellent
75 to less than 80		A (A regular)	3.75	Very good
70 to less than 75		A- (A minus)	3.50	
65 to less than 70		B+ (B plus)	3.25	Good
60 to less than 65		B (B regular)	3.00	
55 to less than 60		B- (B minus)	2.75	Satisfactory
50 to less than 55		C+ (C plus)	2.50	
45 to less than 50		C (C regular)	2.25	Pass
40 to less than 45		D	2.00	
00 to less than 40		F	0.00	Fail

**Table- 3: Grading system for the final assessment**

## 14. Grade Point Average and Cumulative grade point Average

### 14.1 Grade Point Average (GPA)

The Grade Point Average (**GPA**) is computed by dividing the total grade points earned by the number of credit hours attempted in a given semester.

### 14.2 Cumulative grade point Average (CGPA)

The Cumulative Grade Point Average (**CGPA**) is computed by dividing the total grade points earned by the total number of credit hours attempted at the University up to a particular semester.

A **graduating** student **must obtain CGPA at least 2.5** or else she/ he will not be awarded degree. Students have to pay special attention so that their result in each semester should not go under GPA 2.5. However, students will be allowed for registration to the following semester who has minimum GPA 2.0.

## 15. Earned Credit

The courses in which a student has obtained minimum 'D' in 'Theoretical courses', Laboratory courses & General Viva-voce' or higher grade will be counted as credits earned by the student. Any course in which a student has obtained 'F' grade will not be counted towards his/her earned credit. 'F' grade will not be counted for GPA calculation but will stay permanently on the Grade sheet and transcripts.



<b>Chapter 16: Course Requirement for Undergraduate program</b>		
<b>16.1</b>	<b>Introduction</b>	
<b>16.2</b>	<b>Civil Engineering curriculum as per UGC standard syllabus guidelines</b>	
	<b>A</b>	<b>Pre-Requisite Courses of University Requirement</b>
	<b>B</b>	<b>Courses of main curriculum of Civil Engineering Degree</b>
<b>16.3</b>	<b>Titles, Codes, Credit hours and Contact hour of the Courses.</b>	
	<b>A</b>	<b>Pre-requisite Courses of University Requirement</b>
	<b>B</b>	<b>Categories of courses in Civil Engineering as per UGC Guidelines</b>
	<b>B1</b>	<b>Languages and Interdisciplinary Courses</b>
	<b>B2</b>	<b>Basic Sciences</b>
	<b>B3</b>	<b>Mathematics</b>
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	<b>B10</b>	<b>Water Resources Engineering</b>
	<b>B11</b>	<b>Other Sessional</b>
	<b>B12</b>	<b>Civil Engineering practices</b>
	<b>B13</b>	<b>Project Thesis &amp; Viva Voce</b>
	<b>B14</b>	<b>Technical Electives/ Optional</b>
<b>16.4</b>	<b>Semester wise list of Courses</b>	
<b>16.5</b>	<b>Option of elective courses</b>	
<b>Chapter 17: Semester wise Summary of Courses</b>		



## 16. Course Requirement for Undergraduate program

### 16.1 Introduction

The undergraduate students of the Department of Civil Engineering (IIUC) have to follow the course schedule given below. The letter prefix in any course number indicates the discipline of the course viz. CE for Civil Engineering, CSE for Computer Science and Engineering, EEE for Electrical Engineering, Chem for Chemistry, Phy for Physics, Math for Mathematics, Shop for Workshops and UR for University Requirement Course etc.

### 16.2 Civil Engineering curriculum as per UGC standard syllabus guidelines

To prepare students to meet their career objectives, Civil Engineering curriculum is composed (as per UGC standard syllabus guidelines) by the following categories of courses as shown below:

#### A Pre-Requisite Courses of University Requirement

Categories of courses	Types	No of Course	Credit hours	Credit hours & (%)	Remarks
University Requirements Courses.	Theory	6	7	7 (4.1%)	Theory courses are <b>1 or 2 credit</b> hours

#### B Courses of main curriculum of Civil Engineering Degree

Categories of courses	Types	No of Course	Credit hours	Credit hours & (%)	Remarks
General Education: Language and Inter disciplinary	Theory	7	14	15(8.1%)	Theory courses are <b>2 credit</b> hours
	Sessional	1	1		
Basic Sciences	Theory	3	9	12 (7.5%)	Theory courses are <b>3 credit</b> hours and <b>3 contact</b> hours; Lab courses are <b>1.5 credit</b> hours and <b>3 contact</b> hours.
	Sessional	2	3		
Mathematics	Theory	4	12	12 (7.5%)	
Other Engineering (Electrical and Computer)	Theory	2	6	9 (5.5%)	
	Sessional	2	3		
Civil Engineering Core	Theory	20	60	85.5(52.5%)	
	Sessional	17	25.5		
Civil Engineering Practices	Theory	2	4	5.5 (3.5%)	Theory courses are <b>2 credit</b> hours and <b>2 contact</b> hours; Lab courses are <b>1.5 credit</b> hours and <b>3 contact</b> hours.
	Sessional	1	1.5		
Technical Electives: Major	Theory	2	4	5.5 (3.5%)	
	Sessional	1	1.5		
Technical Electives: Minor	Theory	1+1	4	5.5 (3.5%)	
	Sessional	1	1.5		
Research, Thesis & Viva Voce	Theory	1	1	6.0 (3.5%)	
	Thesis & Viva-voce	2	5		
Total Courses: 76 ; Theory = 47; Sessional = 27			163	163 ( 100%)	



### 16.3 Titles, Codes, Credit hours and Contact hour of the Courses.

#### A Pre-requisite Courses of University Requirement:

Sl NO	Categories	Course Code	Course Title	Contact Hour		Credit Hours(CH)		Prerequisite
				Theory	Sessional	Theory	Sessional	
1	Arts & Humanities	URTE-1101	Text of Ethics and Morality	2	-	2	-	
2		URED-1201	Basic Principle of Islam	1	-	1	-	
3		URED-2302	Sciences of Quran and Hadith	1	-	1	-	
4		URIS-3503	Introduction to political thought & Social Behavior	1	-	1	-	
5		URIS-3604	Life & teaching of the Prophet Muhammad (SAAS)	1	-	1	-	
6		URRC-4701	A Survey of Islamic History and culture	1	-	1	-	
		<b>URED-2305 (for non-Muslim)</b>	<b>Comparative Religion (*substitute to URED-1201, URED-2302, URED-3604).</b>	<b>3</b>	<b>-</b>	<b>3</b>	<b>-</b>	

**Number of Courses 6 Theory (6T) and Credit Hours=7**

As per UGC guidelines for standard Syllabus ( Ref; UGC/Private Uni/714(01)/2015/942, dated 31.01.2017) for Civil Engineering Degree , the title of the required courses with course code, credit hours and contact hours are given in the section **16.3.B**. Duration of one credit theory course and one credit laboratory course are 60 minutes and 120 minutes respectively.

#### B Categories of courses in Civil Engineering as per UGC Guidelines

Sl NO	Categories	Course Code	Course Title	Contact Hour		Credit Hours(CH)		Prerequisite
				Theory	Sessional	Theory	Sessional	
<b>B1- Languages and Interdisciplinary Courses: Required number of Courses: 7T +1L, CH =15</b>								
7	English	*UREL-1106	Advance English	2	-	2	-	
8		*UREL-1205	Developing English Language Skills (Lab)	-	2	-	1	
9	Bangla	*URBL-2401	Functional Bengali Language	2	-	2	-	
10	Business	*ACC-2301	Financial and Managerial Accounting	2	-	2	-	
11		*MGT-3601	Industrial and Operational Management	2	-	2	-	
12	Social Science	*ECON-3501	Engineering Economics	2	-	2	-	
13	Ethics & Law	Law-4725	Professional ethics and Environmental protection Law	2	-	2	-	
14	History	*URBS-4802	History of Independence	2	-	2	-	



<b>B2 Basic Sciences : Required number of Courses: 3T+2L; CH =12</b>								
15	Chemistry	*CHEM-1205	Chemistry-1	3	-	3	-	
16		*CHEM-1206	Inorganic and Quantitative Analysis	-	3	-	1.5	CHEM-1101
17	Physics	*PHY-1105	Physics-I (Mechanics, Wave & Oscillation; Light and Thermodynamics)	3	-	3	-	
18		*PHY-1205	Physics-II	3	-	3	-	PHY-1103
19		*PHY-1206	Physics Sessional	-	3	-	1.5	PHY-1103

Asterisk (\*) indicate compulsory courses as per UGC guidelines.

<b>B3 Mathematics : Required number of Courses: = 4T; CH =12</b>								
20	Mathematics	*MATH-1105	<b>Math-I</b> (Differential & Integral Calculus,)	3	-	3	-	
21		*MATH-1205	<b>Math-II</b> ( Differential Equation & Partial Differential Equation)	3	-	3	-	Mathe-1101
22		*MATH-2305	<b>Math-III</b> , Probability, Statistics and Matrices,)	3	-	3	-	
23		*MATH-2405	<b>Math -IV</b> (Linear Algebra, Vector Analysis& Laplace Transform)	3	-	3	-	

Asterisk (\*) indicate compulsory courses as per UGC guidelines.

<b>B4 Other Engineering: Required number of Courses: 2T+2L; CH =9</b>								
24	Electrical Engineering	*EEE-1107	Basic Electrical Engineering	3	-	3	-	
25		*EEE-1108	Basic Electrical Engineering sessional	-	3	-	1.5	
26	Computer Science and Engineering	*CSE-2303	Computer Programming & Numerical Methods in Civil Engineering	3	-	3	-	
27		*CSE-2304	Computer Programming & Numerical Methods in Civil Engineering sessional	-	3	-	1.5	

Asterisk (\*) indicate compulsory courses as per UGC guidelines.



<b>B5-Basic Engineering: Required number of Courses: 7T+3L; CH =25.5</b>								
28	Basic Engineering	*CE-1100	Civil engineering drawing and digital drafting	-	3	-	1.5	
29		*CE1103	Surveying	3	-	3	-	
30		*CE-2301	Analytic Mechanics,	3	-	3	-	
31		CE-2302	Analytic Mechanics Sessional	-	3	-	1.5	CE-2301
32		*CE-1205	Engineering Materials-I	3	-	3	-	
33		*CE-2405	Engineering Geology & Geomorphology	3	-	3	-	
34		*CE-2303	Mechanics of Solids- I	3	-	3		CE-2301
35	Basic Engineering (contd.)	CE-2304	Mechanics of Solids-1 Sessional	-	3	-	1.5	
36		*CE-2403	Fluid Mechanics	3	-	3	-	
37		*CE-3501	Mechanics of Solids- II	3	-	3		CE-2301

**Asterisk (\*) indicate compulsory courses as per UGC guidelines.**

<b>B6 Structural Engineering: Required number of Courses: 5T+3L; CH=19.5</b>								
38	Structural Engineering	*CE-2409	Design of Concrete Structures-I	3	-	3	-	
39		*CE-2410	Concrete Structures Design Sessional-I	-	3	-	1.5	CE-2407
40		*CE-3507	Structural Analysis and Design-I	3	-	3	-	
41		*CE-3603	Design of Concrete Structures-II	3	-	3	-	*CE-2408
42		*CE-3604	Concrete Structures Design Sessional II	-	3	-	1.5	*CE-3603
43		*CE-3605	Structural Analysis and Design-II	3	-	3	-	CE-3507
44		*CE-4807	Design of Steel Structures	3	-	3	-	
45		*CE-4808	Steel Structures Design Sessional	-	3	-	1.5	CE-4807

<b>B7 Environmental Engineering: Required number of Courses:2T+1L; CH=7.5</b>								
46	Environmental Engineering	*CE-3607	Environmental Engineering-I(water source, distribution and treatment )	3	0	3	0	
47		*CE-3608	Environmental Engineering Sessional	-	3	-	1.5	CE-3607
48		*CE-4707	Environmental Engineering-II (Waste water, Sanitation and sewerage)	3	0	3	0	



<b>B8 Geotechnical Engineering: Required number of Courses:2T+1L; CH=7.5</b>								
49	Geotechnical Engineering	*CE-2407	Principles of Soil Mechanics	3	0	3	0	
50		*CE-2408	Geotechnical Engineering Laboratory	-	3	-	1.5	
51		*CE-3601	Foundation Engineering	3	0	3	0	

**Asterisk (\*) indicate compulsory courses as per UGC guidelines.**

<b>B9 Transportation Engineering: Required number of Courses:2T+1L; CH=7.5</b>								
52	Transportation Engineering	*CE-3505	Transportation Engineering-I: (Transportation Planning and Traffic Engineering.)	3	0	3	0	
53	Transportation Engineering (Contd.)	*CE-3506	Transportation Engineering-I (Highway Materials & Traffic Engineering Design) <b>Sessional</b>	-	3	-	1.5	
54		*CE3609	Transportation Engineering-II (Pavement Design and Railway Engineering.)	3	0	3	0	

**Asterisk (\*) indicate compulsory courses as per UGC guidelines.**

<b>B10 Water Resources Engineering: Required number of Courses:2T+1L; CH=7.5</b>								
55	Water Resources Engineering (WRE)	*CE-3503	Open Channel Flow	3	0	3	0	
56		*CE-3504	Open Channel Sessional	-	3	-	1.5	
57		*CE-4709	Hydrology ,Irrigation and flood Management	3	0	3	0	

<b>B11 Other Sessional: Required number of Courses: 7L CH=10.5</b>								
58	<b>Other Sessional</b>	*CE-1104	Carpentry, Welding &Iron shop	-	3	-	1.5	
59		*CE-1206	Concrete sessional	-	3	-	1.5	
60		*CE-1208	Practical Surveying	-	2 week	-	1.5	
61		*CE-3502	Constructional detailing & estimation(Sessional)	-	3	-	1.5	
62		*CE-2404	Fluid Mechanics Sessional	-	3	-	1.5	CE-2403
63		*CE-2306	Quantity Surveying	-	3	-	1.5	CE-2305
64		*CE-4708	Design of water supply, sanitation and Sewerage Systems Sessional	-	3	0	1.5	CE-4707

**Asterisk (\*) indicate compulsory courses as per UGC guidelines.**



<b>B12 Civil Engineering practices: Required number of Courses: 2T+1L; CH=5.5</b>								
65	Civil Engineering practices	*CE-4805	Professional Practices and Communication	2	0	2	0	
66		*CE-4803	Project Planning & Construction Management	2	0	2	0	
67		*CE-4806	Professional Practices and Communication Sessional	0	3	0	1.5	

Asterisk (\*) indicate compulsory courses as per UGC guidelines.

<b>B13 Project Thesis &amp; Viva Voce: Required number of Courses= 3L; CH=6</b>								
68	Technical Electives (Major & Minor)	CE-48xx	Theory from <b>Major option</b>	2	0	2	0	To be offered in 7 <sup>th</sup> Semester
69		CE-48xx	Major corresponding Lab	-	3	0	1.5	
70		CE-48xx	Theory from <b>Minor option</b>	2	0	2	0	
71		CE-48xx	Theory from <b>another Minor option</b>	2	0	2	0	To be offered in 8 <sup>th</sup> Semester
72		CE-48xx	Minor corresponding Lab	-	3	0	1.5	
73		CE-48xx	Theory from <b>Major option</b>	2	0	2	0	
74	Project Thesis & Viva Voce	*CE-4700	Project Thesis		6		4	
75		CE-4701	Research Methodology	1	-	1	-	
76		*CE-4810	Viva Voce	1	-	1	-	

<b>B14 Technical Electives/ Optional:</b>								
1	<b>Option-I:</b> Structural Engineering	CE-4811	Introduction to Finite Element Method	2	0	2	0	
2		CE-4813	Structural Analysis and Design-III	2	0	2	0	
3		CE-4814	Computer Aided Analysis & Design of Structures Sessional	-	3	-	1.5	
4		CE-4815	Pre Stressed Concrete	2	0	2	0	
5		CE-4817	Dynamics Structures	2	0	2	0	

**Major= 2T+1L(from same option) and Minor=2T theory from two other options (1T+1T) and corresponding 1L. Total CH=11**



**B14 Technical Electives/ Optional:**

1	<b>Option-II:</b> Geotechnical Engineering.	*CE-4821	Earth Retaining Structures	2	0	2	0	
2		*CE-4822	Geotechnical Engineering Design Sessional	0	3	0	1.5	
3		CE-4823	Elementary Soil Dynamics	2	0	2	0	
4		CE-4824	Geotechnical Engineering-II Sessional	0	3	0	1.5	
5		CE-4825	Soil-water Interaction	2	0	2	0	
6		CE-4826	Geotechnical Engineering-III Sessional	0	3	0	1.5	

**Major= 2T+1L**(from same option) and **Minor=2T** theory from two other options (1T+1T) and corresponding 1L. **Total CH=11**

1	<b>Option-III:</b> Transportation Engineering.	*CE-4831	Transportation Engineering-III: Traffic Engineering Design and Management	2	0	2	0	
2		*CE-4832	Transportation Engineering-II Sessional: Pavement Design and Traffic Studies	0	3	0	1.5	
3		*CE-4833	Transportation Engineering-IV: Pavement Management, Drainage and Airport	2	0	2	0	
4		CE-4834	Transportation Engineering-IV Sessional	0	3	0	1.5	CE-4845
5		CE-4835	Transportation Engineering-V :Urban Transportation Planning and Management	2	0	2	0	
6		CE-4836	Transportation Engineering-V Sessional	0	3	0	1.5	CE-4847

**Major= 2T+1L**(from same option) and **Minor=2T** theory from two other options (1T+1T) and corresponding 1L. **Total CH=11**



**B14 Technical Electives/ Optional:**

1	<b>Option-IV</b> Environmental Engineering	*CE-4841	Solid and Hazardous Waste Management	2	0	2	0	
2		*CE-4843	Environmental Pollution Management	2	0	2	0	
3		*CE-4844	Environmental Pollution Management Sessional	0	3	0	1.5	CE-4653
4		CE-4845	Environmental and Sustainable Management	2	0	2	0	
5		CE-4846	Environmental Pollution Management Sessional	0	3	0	1.5	CE-4855

**Major**= 2T+1L(from same option) and **Minor**=2T theory from two other options (1T+1T) and corresponding 1L. **Total CH=11**

1	<b>Option-V</b> Water Resource Engineering	*CE-4851	Flood Mitigation and Management	2	0			
2		*CE-4852	Water Resources Engineering Sessional	0	3	0	1.5	
3		CE-4853	Hydraulic Structures	2	0	2	0	
4		CE-4854	Hydraulic Structures Sessional	0	3	0	1.5	
5		CE-4855	Groundwater Engineering	2	0	2	0	
6		CE-4857	River Engineering	2	0	2	0	
7		CE-4859	Costal Engineering	2	0	2	0	

**Major**= 2T+1L(from same option) and **Minor**=2T theory from two other options (1T+1T) and corresponding 1L. **Total CH=11**



### 16.4 Semester wise list of Courses.

Sl NO	Course Code	Course Title	Contact Hours		Credit Hours		Prerequisite
			Theory	Sessional	Theory	Sessional	
<b>1<sup>st</sup> Semester</b>							
1	*CE-1100	Civil engineering drawing and digital drafting	-	3	-	1.5	
2	*CE-1103	Surveying	3	-	3	-	
3	*CE-1104	Carpentry, Welding & Iron shop	-	3	-	1.5	
4	*EEE-1107	Basic Electrical Engineering	3	-	3	-	
5	*EEE-1108	Basic Electrical Engineering, sessional	-	3	-	1.5	
6	*PHY-1105	Physics-I(Mechanics, Wave & Oscillation; Light and Thermodynamics)	3	-	3	-	
7	*MATH-1105	<b>Math-I</b> (Differential & Integral Calculus,)	3	-	3	-	
8	*UREL-1106	Advance English	2	-	2	-	
9	URTE-1101	Text of Ethics & Morality	2	-	2	-	
Total number of courses=(6 theory +3 sessional ) = <b>9</b> ; Total credit Hours= <b>20.5</b> ; Total Contact Hours= <b>25</b>							
<b>Asterisk (*) indicate compulsory courses for Civil Engineering as per UGC guidelines</b>							

<b>2<sup>nd</sup> Semester</b>							
10	*CE-1205	<b>Engineering Materials-I</b>	3	-	3	-	
11	*CE-1206	Concrete sessional	-	3	-	1.5	
12	*CE-1208	Practical Surveying	-	2 week	-	1.5	
13	*CHEM-1205	<b>Chemistry-1</b>	3	-	3	-	
14	*CHEM-1206	Inorganic and Quantitative Analysis(Sessional)	-	3	-	1.5	CHEM-1205
15	*PHY-1205	<b>Physics-II</b>	3	-	3	-	PHY-1103
16	*PHY-1206	Physics Sessional	-	3	-	1.5	PHY-1103
17	*MATH-1205	<b>Math-II</b> ( Differential Equation & Partial Differential Equation)	3	-	3	-	Mathe-1101
18	*UREL-1205	Developing English Language Skills (Lab)	-	2	-	1	UREL-1106
19	URED-1201	Basis Principle of Islam	2	-	1	-	
Total number of courses=( 5 theory +5 sessional)=10; Total credit Hours=20 ; Total Contact Hours= 25							
<b>Asterisk (*) indicate compulsory courses for Civil Engineering as per UGC guidelines</b>							



3 <sup>rd</sup> Semester							
20	*CE-2301	Analytic Mechanics,	3	-	3	-	Mathe-1201
21	CE-2302	Analytic Mechanics Sessional	-	3	-	1.5	CE-2301
22	*CE-2303	Mechanics of Solids- 1	3	-	3		CE-2301
23	*CE-2304	Mechanics of Solids –I Sessional	-	3	-	1.5	
24	*CE-2306	Quantity Surveying	-	3	-	1.5	
25	*CSE-2303	Computer Programming & Numerical Methods in Civil Engineering	3	-	3	-	
26	*CSE-2304	Computer Programming & Numerical Methods in Civil Engineering sessional	-	3	-	1.5	CSE-1203
27	*MATH-2305	<b>Math-III</b> Probability, Statistics & Matrices	3	-	3	-	
28	*ACC-2301	Financial and Managerial Accounting	2	-	2	-	
29	URED-2302	Sciences of Quran & Hadith	2	-	1	-	
Total number of courses=( 6 theory +4 sessiona) = 10; Total credit Hours- <b>21</b> ; Total Contact Hours= <b>28</b>							
<b>Asterisk (*) indicate compulsory courses for Civil Engineering as per UGC guidelines</b>							

4 <sup>th</sup> Semester							
30	*CE-2403	Fluid Mechanics	3	-	3	-	
31	*CE-2404	Fluid Mechanics Sessional	-	3	-	1.5	CE-2403
32	*CE-2405	Engineering Geology & Geomorphology	3	-	3	-	
33	*CE-2407	Principles of Soil Mechanics	3	0	3	0	
34	*CE-2408	Geotechnical Engineering Laboratory	-	3	-	1.5	CE-2405
35	*CE-2409	Design of Concrete Structures-I	3	-	3	-	
36	*CE-2410	Concrete Structures Design Sessional-1	-	3	-	1.5	CE-2409
37	*MATH-2405	Math-IV (Linear Algebra, Matrices and Vector Analysis)	3	-	3	-	
38	URBL-2401	Functional Bengali Language	2	-	2	-	
Total number of courses=(6 theory +3 sessional)=9; Total credit Hours- <b>21.5</b> ; Total Contact Hours= <b>28</b>							
<b>Asterisk (*) indicate compulsory courses for Civil Engineering as per UGC guidelines</b>							



5 <sup>th</sup> Semester							
39	*CE-3501	Mechanics of Solids- II	3	-	3		CE-2401
40	*CE-3502	Constructional detailing and estimation (Sessional)	-	3	-	1.5	
41	*CE-3503	Open Channel Flow	3	0	3	0	
42	*CE-3504	Open Channel Sessional	-	3	-	1.5	
43	*CE-3505	Transportation Engineering-I: (Transportation Planning and Traffic Engineering.)	3	0	3	0	
44	*CE-3506	Transportation Engineering-I (Highway Materials & Traffic Engineering Design) Sessional	-	3	-	1.5	
45	*CE-3507	Structural Analysis and Design-I	3	-	3	-	
46	*ECON-3501	Engineering Economics	2	-	2	-	
47	URIS-3503	Introduction to political thought, Dealings & Behaviour	2	-	1	-	
<b>Total number of courses=( 6 theory +3 sessional)=9; Total credit Hours= 19.5; Total Contact Hours= 25</b>							
<b>Asterisk (*) indicate compulsory courses for Civil Engineering as per UGC guidelines</b>							

6 <sup>th</sup> Semester							
48	*CE-3601	Foundation Engineering	3	0	3	0	
49	* CE-3603	Design of Concrete Structures-II	3	-	3	-	*CE-2408
50	* CE-3604	Concrete Structures Design Sessional II	-	3	-	1.5	*CE-3603
51	*CE-3605	Structural Analysis and Design-II	3	-	3	-	CE-3507
52	*CE-3607	Environmental Engineering-I (water source, distribution and treatment)	3	0	3	0	
53	*CE-3608	Environmental Engineering Sessional	-	3	-	1.5	CE-3607
54	*CE3609	Transportation Engineering-II(Pavement Design and Railway Engineering.)	3	0	3	0	
55	*MGT- 3601	Industrial and Operational Management	2	-	2	-	
56	URIS-3604	Life and teaching of the Prophet(SAAS)	2	-	1	-	
<b>Total number of courses=( 7 theory +2 sessional)=9; Total credit Hours= 21; Total Contact Hours= 25</b>							
<b>Asterisk (*) indicate compulsory courses for Civil Engineering as per UGC guidelines</b>							



7 <sup>th</sup> Semester							
57	*CE-4700	Project/ Thesis		6		4	
58	*CE-4707	Environmental Engineering-II (Waste water, Sanitation and sewerage)	3	0	3	0	
59	*CE-4708	Design of water supply, sanitation and Sewerage Systems Sessional	-	3	0	1.5	CE-4707
60	*CE-4709	Hydrology ,Irrigation and flood Management	3	0	3	0	
61	CE-48xx	Theory from Major option	2	0	2	0	
62	CE-48xx	Major corresponding Lab	-	3	0	1.5	
63	CE-48xx	Theory from Minor option	2	0	2	0	
64	*Law-4725	Professional ethics and Environmental protection Law	2	0	2	0	
65	URRC-4701	A survey of Islamic History & Culture	2	0	1	0	
Total number of courses=( 6 theory +3 sessional)=9; Total credit Hours= 20; Total Contact Hours= 25							

8 <sup>th</sup> Semester							
66	CE-48xx	Theory from another Minor option	2	0	2	0	
67	CE-48xx	Minor corresponding Lab	-	3	0	1.5	
68	CE-48xx	Theory from Major option	2	0	2	0	
69	CE-4801	Research Methodology	1	-	1	-	
70	*CE-4803	Project Planning & Construction Management	2	0	2	0	
71	*CE-4805	Professional Practices and Communication	2	0	2	0	
72	*CE-4806	Professional Practices and Communication Sessional	0	3	0	1.5	
73	*CE-4807	Design of Steel Structures	3	-	3	-	
74	*CE-4808	Steel Structures Design Sessional	-	3	-	1.5	
75	*CE-4810	Viva Voce	-	1	-	1	
76	*URBS-4802	History of Bangladesh Independence	2	-	2	-	
Total number of courses=( 7 theory +4 sessional)= 11; Total credit Hours=19.5;Total Contact Hours= 23							
<b>Asterisk (*) indicate compulsory courses for Civil Engineering as per UGC guidelines</b>							
<b>Technical Electives: Major= 2T+1L(from same option) and Minor=2T theory from two other options (1T+1T) and one corresponding Lab. Total CH=11</b>							



## 16.5 Option of elective courses

Students will take two electives as Major from one group with one corresponding sessional & two more optional courses from different groups as Minor with one corresponding sessional from any of these groups. Major=2T+1L (from same group) and Minor= 2T (one from each different groups) +1L from corresponding minor group. IT=2CH & 1L=1.5CH.Total= 11 CH. There are five groups for **Major** in B.Sc Civil Engineering degree as listed below.

### Options

<b>I</b>	Major in Structural Engineering
<b>II</b>	Major in Geotechnical Engineering
<b>III</b>	Major in Transportation Engineering
<b>IV</b>	Major in Environmental Engineering
<b>V</b>	Major in Water Resource Engineering

## 17 Semester wise Summary of Courses

Semesters	No. of Courses	Contact hours/Week			Credit Hours		
		Theory	Lab	Total	Theory	Lab	Total
1 <sup>st</sup>	9.0	16	9.0	25	16	4.5	20.5
2 <sup>nd</sup>	10	14	11	25	13	7.0	21
3 <sup>rd</sup>	10	16	12	28	15	6.0	20
4 <sup>th</sup>	9.0	17	9.0	26	17	4.5	22
5 <sup>th</sup>	9.0	16	9.0	25	15	4.5	20
6 <sup>th</sup>	9.0	19	6.0	25	18	3.0	20
7 <sup>th</sup>	9.0	14	9.0	23	13	7.0	20
8 <sup>th</sup>	11	14	10	24	14	5.5	19.5
<b>Total</b>	<b>76</b>	<b>126</b>	<b>75</b>	<b>201</b>	<b>121</b>	<b>42</b>	<b>163</b>



আন্তর্জাতিক ইসলামী বিশ্ববিদ্যালয় চট্টগ্রাম  
الجامعة الإسلامية العالمية شيتاغونغ  
International Islamic University Chittagong  
Department of Civil of Engineering (CE), FSE



Chapter 18: Semester wise Summary of Courses		
18.1	FIRST SEMESTER	
18.2	SECOND SEMESTER	
18.3	THIRD SEMESTER	
18.4	FOURTH SEMESTER	
18.5	FIFTH SEMESTER	
18.6	SIXTH SEMESTER	
18.7	SEVENTH SEMESTER	
18.8	EIGHTH SEMESTER	



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**Department of Civil of Engineering (CE), FSE**

**FIRST  
SEMESTER**



**THEORY**

<b>Course Code: CE-1103</b>		<b>Course Title: Surveying</b>	
<b>Credit Hours=3</b>		<b>Contact Hours: 3 Hours per week</b>	
<b>Section –A: (Mid-term Exam: 30 Marks)</b>			
<b>Introduction to survey:</b>	Linear measurements, chain survey, traverse survey & plane table survey		
<b>Leveling &amp; Contouring:</b>	Calculation of areas and volumes, Problems on heights and distances,		
<b>Curves and curve ranging:</b>	Horizontal and vertical curves,		
<b>Section- B (Final Exam: 50 Marks): Group- A (20-Marks)</b>			
<b>Route Survey</b>	Tacheometry: introduction, principles and problems on tacheometry		
<b>Triangulation</b>	Errors in surveying.		
<b>Group-B (30 marks)</b>			
<b>Astronomical surveying</b>	Definition, instruments, astronomical corrections and systems of time.		
<b>Potogrametry</b>	Introduction to terrestrial photography, aerial photography, reading of photo mosaic and scale.		
<b>Aerial photography:</b>	Air photo interpretation. Project surveying: errors in surveying, remote sensing, introduction to geographic information system (GIS) and introduction to global positioning system (GPS).		
<b>Recommended Books</b>	1) Bannister, S., & Raymond, R B. (1992). Surveying, Longman Scientific & Technical. 2) Paul, R.W. (1987). <i>Elementary Surveying</i> . Sydney: Harper & Row. 3) Harry L. F. (2004). <i>Landscape Surveying</i> . NY: Thomson/Delmar Learning.		

<b>Course Code: EEE-1107</b>		<b>Course Title: Basic Electrical Engineering</b>	
<b>Credit Hours: 2</b>		<b>Contact Hours: 3 hrs. per week</b>	
<b>Section –A: (Mid-term Exam: 30 Marks)</b>			
<b>Electrical units &amp; standards</b>	Electrical circuit-laws, Kirchhoff's voltage & current laws.		
<b>Network theorems</b>	Superposition. Thevenin's and Norton's. Current sources, equivalence of voltage and current sources.		
<b>Transmission line</b>	Circuit solution series, parallel; -Y transformation and mesh current methods.		
<b>Section- B (Final Exam: 50 Marks): Group- A (20-Marks)</b>			
<b>Alternating instantaneous</b>	voltage current and power, RMS. and AVG values of A.C. Quantities,		
<b>Phasor algebra</b>	<b>Phasor algebra</b> as applied to A.C. circuit analysis, Vector diagrams for single-phase series and parallel circuits.		
<b>Group- B (30-Marks)</b>			
<b>D.C. Generator:</b>	Principle of operation, classification, Characteristics.		
<b>D.C. Motor:</b>	Principle of operation classification, speed control and starting. performance and testing Induction motor		
<b>Transformer</b>	Single phase Transformer, operation, principle operation, configuration, transistor biasing. Simple amplifiers and oscillators.		



<b>Recommended Books:</b>	<ol style="list-style-type: none"> <li>1. Boylston, R.L. (2003). <i>Introductory circuit Analysis</i>. Prentice Hall.</li> <li>2. Alexander, C.K., &amp; Sadiku, M.N.O. (2003). <i>Fundamentals of Electric Circuits</i>. McGraw-Hill.</li> <li>3. Nilsson, J., &amp; Riedel, S. (2005). <i>Electric Circuits</i>. Prentice-Hall,</li> <li>4. R.C.Dorf and J. A. Svoboda, (2004) <i>Introduction to Electric Circuits</i>. John Wiley.</li> <li>5. Hayet, W.H, Kemmerly, Jr.J.E, &amp; Durbin, S.M. (2002). <i>Engineering Circuit Analysis</i>. McGraw-Hill 5</li> </ol>
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<b>Course Code: PHY-1105</b> <b>Credit Hours: 3</b>	<b>Course Title: Physics-I (Mechanics, Wave &amp; Oscillation; Light and Thermodynamics) Contact Hours: 3 hrs per week</b>
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<b>Section-A: (Mid-term Exam: 30 Marks)</b>	
<b>Dynamics of Rigid Body</b>	Linear motion of a body as function of time, position and velocity; momentum , conservation theorem of momentum and energy collision and torque, center of mass of rigid body, rotational kinetic energy, fly wheel, exes theorems and their applications.
<b>Waves and oscillations</b>	Differential equation of a simple harmonic oscillator, total energy and average energy, combination of simple harmonic oscillations, Lissajous figures, spring-mass system, calculation of time period of torsional pendulum, Damped oscillation, determination of damping co-efficient;
<b>Forced Oscillation, resonance</b>	Forced oscillation, resonance, two-body oscillations, reduced mass, differential equation of a progressive wave, power and intensity of wave motion, Stationary wave, group velocity and phase velocity, architectural acoustics, reverberation and Sabine's formula.
<b>Section-B (Final Exam: 50 Marks): Group-A (20 Marks)</b>	
<b>Physical optics</b>	theories of light; Young's double slit experiment, displacement of fringes and its uses, Fresnel bi-prism, interference at wedge shaped films, Newton's rings, interferometers; diffraction of light; Fresnel and Fraunhofer diffraction, diffraction by single slit, diffraction from a circular aperture, resolving power of optical instruments, diffraction at double slit and n-slits-diffraction grating;
<b>Polarization</b>	production and analysis of polarized light, Brewster's law, Malus law, polarization by double refraction, retardation plates, nicol prism, optical activity, polarimeters, polaroid.
<b>Group-B (30 Marks)</b>	
Heat and thermodynamics	principle of temperature measurements: platinum resistance thermometer, thermo-electric thermometer, pyrometer; kinetic theory of gases: Maxwell's distribution of molecular speeds, mean free path, equipartition of energy, Brownian motion, Vander Waal's equation of state,
Review of the first law of thermodynamics	And its application, reversible and irreversible processes, second law of thermodynamics, Carnot cycle; efficiency of heat engines, Carnots theorem,
Entropy and disorder	Entropy and disorder, thermodynamic functions, Maxwell relations, Clausius-Clapeyron equation, Gibbs phase rule, third law of thermodynamics.



Recommended Books	<ol style="list-style-type: none"> <li>Halliday, D. &amp; Resnick, R. (1968). <i>Physics Part I</i>. John Wiley &amp; Sons, Inc</li> <li>Constant, F.W. <i>Theoretical Physics</i>.</li> <li>Young &amp; Freedman. (2007). <i>University Physics</i>. Benjamin Cummings.</li> <li>Mathur, D.S.(2010). <i>Properties of Matter</i>. S Chand &amp; Co Ltd.</li> <li>Britzall &amp; Subramanyum, N. (2006). <i>A text Book of Sound</i>. S Chand &amp; Co Ltd .</li> <li>Britzall &amp; Subramanyum, N. (2008). <i>Heat and thermodynamics</i>. S Chand &amp; Co Ltd .</li> <li>Britzall &amp; Subramanyum, N. (2010). <i>Properties of matter</i>. S Chand &amp; Co Ltd</li> </ol>
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<b>Course Code: MATH-1105</b>	<b>Course Title: Math I (Differential and Integral Calculus) Contact Hours: 3 per Week</b>
<b>Credit Hours: 3</b>	
<b>Objectives</b>	In this course student learn about ‘Mathematics’ in regards to functions, ordinary and partial differentiation, indefinite and definite integral, multiple integral and integration by revolution.
<b>Section –A: (Mid-term Exam: 30 Marks)</b>	
<b>Functions</b>	Limit of Functions, continuity and differentiability, physical meaning of derivative of a function, Indeterminate Form.
<b>Ordinary Differentiation</b>	Differentiation, successive differentiation and Leibniz theorem,
<b>Expansions of Functions</b>	<ol style="list-style-type: none"> <li>Rolle’s theorem, mean value theorem</li> <li>Taylor's and Maclaurian's Formulae</li> </ol>
<b>Section- B (Final Exam: 50 Marks): Group- A (20-Marks)</b>	
<b>Partial Differentiation</b>	Partial Differentiation, Euler’s formula, Maxima and minima.
<b>Indefinite integral</b>	Physical meaning of integration of a function, method of Substitution, Integration by parts, special trigonometric functions and rational fractions different techniques of integration.
<b>Group-B (30 Marks)</b>	
<b>Definite integral</b>	Fundamental theorem, general properties, and evaluations of definite integral and reduction formula, definite integral as the limit of a sum, Integration by successive reduction, Gamma and Beta Function
<b>Multiple Integral</b>	Double Integral, Evaluation of double integral, Change of order of integration, triple Integral, Application of double and triple integral.
<b>Integration by Revolution</b>	Determination of length of curves, Areas of plane region and Areas of surfaces of solids of revolution, Volumes of solids of revolution.
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>Thomas, F.(1995). <i>Calculus and analytic geometry</i>. Addison Wesley.</li> <li>Stroud, K.A.(2013). <i>Engineering Mathematics</i>.</li> <li>Bhattacharjee, P.K. <i>Differential Calculus</i>.</li> <li>Bhattacharjee, P.K. <i>Integral Calculus</i>.</li> <li>Anton,H.(1998). <i>Calculus A New Horizon</i>, Wiley.</li> <li>Kreyszig, F. (2011). <i>Advanced Engineering Mathematics</i>. Wiley.</li> <li>Yusuf ,A. <i>Differential Calculus</i></li> <li>Das &amp; Mukherjee.(1964). <i>Differential Calculus</i>. Ulan Press, Dhur.</li> <li>Das &amp; Mukherjee.(1964). <i>Integral Calculus</i>. Ulan Press, Dhur</li> </ol>



<b>Course Code: URTE-1101</b> <b>Credit Hours: 2</b>		<b>Course Title: Text of Ethics &amp; Morality</b> <b>Contact Hours: 2 per Week</b>	
<b>Course Synopsis</b>	<p>The course deals with fundamental text of ethics along with Arabic language. Ethics - moral principles- governs a person's behavior in all spheres of life. The success of all branches of education including literature, science, mathematics, law, pharmacy, journalism, economics, politics, and so on are deeply related to ethics. The Holy Qur'an is the main and basic book of ethics. It is written in Arabic language. This language is an international language, and about 250 million people use Arabic as first language and another 200 million people use it as second language. It is used as official language in more than 20 countries especially in the Middle East. It stands in fourth position in six official languages of United Nations and ranks a remarkable place in labor market. There are many books of science; medicine, mathematics etc. written in modern standard Arabic language. The course, therefore, is an essential one for all novices to attain their goal successfully obtaining ethical knowledge along with being skilled with an international and an influential language.</p>		
<b>Course Objectives</b>	<p>To make students capable of understanding the basic Arabic language so that they can communicate with the foreign countries and be fit with labor market worldwide especially in the Middle East. To inspire students and make them interested in reading the basic ethical book and the complete code of life. To make students familiar with their life being enlightened with them. To go towards achieving the motto of the university – to combine quality with morality.</p>		



**SESSIONAL**

<b>Course Code: CE-1100</b>		<b>Course Title: Civil Engineering Drawing and Digital Drafting</b>	
<b>Credit Hours: 1.5</b>		<b>(Sessional) Contact Hours: 3 hours per week</b>	
<b>Introduction</b>	Handling of instruments and their uses, Lettering and Numbering and heading. Plane geometry, Pentagon, Hexagon, Octagon, Ellipse, parabola, Hyperbola.		
<b>Projection (Solid Geometry)</b>	Cube, Triangle, Prism, Pentagonal Prism, hexagonal prism, Cone, Cylinder. Development of different types of section: Cube, Triangle, Prism, Cone, Cylinder, True Shape: Cube, Triangle, Prism, Pentagonal Prism, Hexagonal Prism, Cone, Cylinder.		
<b>Isometric drawing</b>	Cube, Triangle, Prism, Pentagonal Prism, hexagonal Prism, Cone, Cylinder, Interpretation of Solids		
<b>Laws and regulations</b>	By different authorities like CDA, RAJUK, RAUK, KDA etc. Architectural requirements, Architectural records, Architectural approaches of drawings; B.N.B.C. requirements (Part-3, Chap-1).		
<b>Preliminary planning of one-unit housing</b>	Plans, elevations and sections of multistoried buildings, Drawing of different types of stairs, Reinforcement details of beams, slabs, stairs etc. Plan and section of septic tanks.		
<b>Preliminary studies about planning of multistoried apartments</b>	sky scrapers, auditorium, Educational, hospital, etc. Building services (plumbing, Sanitary, electrical) drawings. Auto-cad design.		
<b>Recommended Books</b>	1. Giesecke, F.E., Hill, I. L., & Dygdon, J.T. (1980). <i>Technical Drawing</i> . New York, NY: Macmillan. 2. Salaby, S. <i>Descriptive Geometry</i>		

<b>Course Code: Shop-1104</b>		<b>Course Title: Carpentry, Welding &amp; Iron Shop</b>	
<b>Credit Hours= 1.5</b>		<b>Contact Hours: 3 Hours per week</b>	
<b><u>Carpentry shop</u></b>	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.		
<b><u>Machine shop</u></b>	Kinds of tools: common bench and hand tools, marking and layout tools, measuring tools, cutting tools, machine tools, and bench work with job. Drilling, shaper, Lathe and Milling Machines, Introduction, type, size and capacity, uses and applications.		
<b><u>Welding shop</u></b>	Methods of metal joints, Riveting, grooving soldering, welding, Types of welding, joints and welding practice, position of arc welding and polarity, flat, vertical, horizontal, overhead, Electric arc welding and its machinery, welding of different types of material, Low carbon steel, cast iron, brass, copper, stainless steel,		



Course Code: EEE-1108 Credit Hours: 1.5- Prerequisite EEE-1107		Course Title: Basic Electrical Engineering Sessional Contact Hours: 3 hrs per week
List of Experiments based on EEE-1251.	1) Measurement of electrical quantities: Current, Voltage, resistance; 2) Measuring Instruments: Ammeter, Voltmeter, Wattmeter and circuit theorems. 3) Measurement of AC quantities, Application of AC circuit analysis. House wiring. 4) Generator and motor based experiments, 5) Transformer and PN diode related experiment.	

Course Code: UREL-1106 Credit Hours: 2		Course Title: Advance English Contact Hours: 2 per Week
<b>Section –A (Mid-term Exam: 30 Marks)</b>		
<b>Introduction</b>	current approaches to learning English, communication today	
<b>Phonetics</b>	Phonetics and correct English pronunciation.	
<b>Syntax</b>	Vocabulary, diction and English sentence; sentence variety and style; grammatical problems.	
<b>Section- B (Final Exam: 50 Marks) Group- A (20-Marks)</b>		
<b>Reading skill</b>	readability, reading strategies, generating ideas through purposive reading	
	Reading of selected stories, comprehension.	
<b>Group-B (30 Marks)</b>		
<b>Writing Skill</b>	Principles of effective writing; generating ideas, planning, organization and development of writing; composition, précis.	
<b>Written communication</b>	Business communication, tenders and quotations, journal articles, report.	
<b>Oral communication</b>	Dialogue, technical and scientific presentation.	



আন্তর্জাতিক ইসলামী বিশ্ববিদ্যালয় চট্টগ্রাম  
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**SECOND  
SEMESTER**



## THEORY

<b>Course Code: CE-1205</b> <b>Credit Hours: 3</b>	<b>Course Title: Engineering Materials-I</b> <b>Contacts Hours: 3 Hrs per week</b>
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>	
<b>1. Engineering material and their properties;</b> Manufacturing process of bricks and cement. <b>2. Properties and uses of bricks,</b> cement, aggregates, cement and lime mortars, <b>3. Standard tests</b> of bricks cement and aggregate;	
<b>Section- B (Final Exam: 50 Marks)</b> <b>Group- A (20-Marks)</b>	
<b>4. Timber,</b> uses of rubber and plastics; corrosion and its prevention; paints, varnishes, metallic coatings. <b>5. Concrete:</b> Composition, Properties of fresh concrete-mixing, workability, Transportation, Compaction, curing, segregation and bleeding, admixture,	
<b>Group- B (30-Marks)</b>	
<b>6. Design of concrete mix,</b> properties of hardened concrete, mechanical properties, shrinkage, elasticity, plasticity, special concrete, <b>7. Durability of concrete:</b> factors affecting durability, chemical attack on concrete, chloride and sulphate attack; concrete in sea environment, <b>8. Corrosion</b> of reinforcement in concrete, remedial measures; Ferro cement.	
<b>Recommended Books</b>	<ol style="list-style-type: none"><li>1. Ling, H.I, &amp;Tatsuok, D.L.F. (2003). <i>Reinforced Soil Engineering- Advances in Research and Practice</i>. CRC Press.</li><li>2. Foster, M.S. (2007). <i>Materials of Industry – Their Distribution and Production</i>. Brunauer Press.</li><li>3. Sullivan, J. (2002). <i>Structural Engineering Compendium</i>. Elsevier.</li><li>4. Westinghouse. (2011). <i>Science and Civilization Vol. 1</i>. Nabu Press ,</li><li>5. Kotsovos, M.D. &amp; Pavlovic, M.N. (1998). <i>Structural Concrete: Finite-element Analysis for Limit-state Design</i>. Thomas Telford Ltd.</li></ol>



<b>Course Code: CHEM-1205</b> <b>Credit Hours=3</b>	<b>Course Title: Chemistry (Inorganic and Quantitative Analysis)</b> <b>Contact Hours: 3 Hours per week</b>
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>	
<ol style="list-style-type: none"><li>1. Atomic structure and quantum theory: Bohr's theory, Heisenberg's uncertainty principle, Schrödinger's wave equation,</li><li>2. Electronic configurations and properties of atoms; electronic configurations and properties of molecules: chemical bond, valence bond theory,</li><li>3. Structure and properties of Boron, Silicon, Germanium, Preparation of pure silicon, Intrinsic and extrinsic semiconductors, p-n junction, and Application of semiconductors</li></ol>	
<b>Section- B (Final Exam: 50 Marks)</b> <b>Group- A (20-Marks)</b>	
<ol style="list-style-type: none"><li>4. Chemistry of halogen, alkali metals, alkaline earth metals, non-metals and heavy metals; modern concepts of acids and bases; Chemical and ionic equilibria; chemistry of water; chemistry of water pollution; chemistry of cements, silicates and limes.</li><li>5. The Characteristics of transition metals, Werner's Theory, Sidgwick's theory, Effective Atomic number, Pauling's theory, Limitations of Pauling's Theory, Stereochemistry of coordination compounds.</li></ol>	
<b>Group-B (30 marks)</b>	
<ol style="list-style-type: none"><li>6. <b>Solutions:</b> Types of solution, Henry's Law, Factor's affecting solubility, Solubility curves, Nernst distribution law, solvent extraction, Vapour pressures of liquid solutions, Azeotropic mixtures and separation of Components by distillation, Colligative properties of dilute solutions: Lowering of Vapor pressure, Elevation of boiling point, Depression of freezing point, Osmotic pressure.</li><li>7. <b>Instrumental analysis:</b> Chromatographic methods of chemical analysis, Theories of chromatography, Column chromatography, Thin layer chromatography (TLC), Gas liquid chromatography (GLC), High performance liquid chromatography,</li><li>8. Beer-Lambert's law/Basic components of a spectrometer, Radiation sources, Wavelength selectors, Different types of radiation detectors, Signal processors and readout device.</li></ol>	
<b>Recommended Books</b>	<ol style="list-style-type: none"><li>1. Van, A.E. (1991). <i>The Elementary Principles of Chemistry, Part I</i>. N.Y: D. Appleton and Company.</li><li>2. Hass, A.J. (2007). <i>Elementary Chemistry</i>. Adler Press.</li><li>3. William Allen Miller, W.A. (2005). <i>Elements of Chemistry Theoretical and Practical</i>. Scholarly Publishing Office, University of Michigan.</li><li>4. Robert, F. (2012). <i>Elementary Chemistry: Progressive Lessons in Experiment and Theory, Part I</i>. Ulan Press.</li></ol>



<b>Course Code: PHY-1205</b> <b>Credit Hours=3</b>	<b>Course Title: Physics-II ( Structure of matter, Electricity and Magnetism, Modern and Quantum Physics)</b> <b>Contact Hours: 3 Hours per week</b>
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>	
<ol style="list-style-type: none"><li>1. Structure of matter : crystalline and non-crystalline solids, single crystal and polycrystal solids, unit cell, crystal systems, co-ordinations number, crystal planes and directions, NaCl and CsCl structure,</li><li>2. Packing factor, Miller indices, relation between inter planar spacing and Miller indices, Bragg's law, methods of determination of inter planar spacing from diffraction patterns; defects in solids: point defects, line defects,</li><li>3. Bonds in solids, inter atomic distances, calculation of cohesive and bonding energy; introduction to band theory: distinction between metal, semiconductor and insulator.</li></ol>	
<b>Section- B (Final Exam: 50 Marks)</b> <b>Group- A (20-Marks)</b>	
<ol style="list-style-type: none"><li>4. Electricity and magnetism: Coulomb's law, electric field (E), Gauss's law and its application, electric potential (V), capacitors and capacitance, capacitors with dielectric, dielectric and atomic view, charging and discharging of a capacitor, Ohm's law, Kirchoff's law;</li><li>5. Magnetic field: magnetic induction, magnetic force on a current carrying conductor, torque on a current carrying loop, Hall effect, Faradays law of electromagnetic induction, Lenz's law, self induction, mutual induction; magnetic properties of matter; hysteresis curve;</li></ol>	
<b>Group-B (30 marks)</b>	
<ol style="list-style-type: none"><li>6. Electromagnetic oscillation: L-C oscillations and its analogy to simple harmonic motion.</li><li>7. Modern physics: Michelson-Morley's experiment, Galilean transformation, special theory of relativity and its consequences; quantum theory of radiation; photo-electric effect, Compton effect,</li><li>8. Wave particle duality, interpretation of Bohr's postulates, radioactive disintegration, properties of nucleus, nuclear reactions, fission, fusion, chain reaction, nuclear reactor.</li></ol>	
<b>Recommended Books</b>	<ol style="list-style-type: none"><li>1. Huq, Rafiquallah &amp; Roy. <i>Concept of Electrical and Magnetism</i></li><li>2. Halliday, D. &amp; Resnick, R. (1992). <i>Physics II</i>. Wiley</li><li>3. Britzall &amp; Subramanyum. (2010). <i>Atomic &amp; Molecular Physics</i>. S Chand &amp; Co Ltd</li><li>4. Beiser, A. (2002). <i>Concept of Modern Physics</i>. McGraw-Hill</li></ol>



<b>Course Code: UREL-1205</b>		<b>Course Title: English ( Developing English Language Skills) Lab</b>	
<b>Credit Hours=1</b>		<b>Contact Hours: 2 Hours per week</b>	
<b>Reading skill</b>	Skimming, scanning, predicting, inferring; analysis and interpretation of texts; comprehension from literary and non-literary texts.		
<b>Writing skill</b>	Product approach, process approach: brain storming, self-evaluation, peer evaluation, revision/rewriting, teacher's evaluation; techniques of writing: comparison and contrast, problem and solution, cause and effect, classification, illustration; writing paragraph, essay and report.		
<b>Listening skill</b>	Listening to recorded texts; learning to take useful notes and answering questions.		
<b>Speaking skill</b>	Dialogue in peer work; participation in discussion and debate; extempore speech; narrating events; story telling; presentation.		

<b>Course Code: MATH-1205</b>		<b>Course Title: Math II ( Differential Equations and Partial Differential Equations) Contact Hours: 3 Hours per week</b>	
<b>Credit Hours=3</b>			
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>			
1. First order differential equation	Definition, solution of first order and first degree differential equation with initial conditions, Solution of Linear differential Equation, homogeneous equations, Bernoulli Equation, Exact Differential equations, Integrating Factors, Boundary Value Problems.		
2. Higher order Differential equations with constant coefficients:	Solution of higher order homogeneous differential equations, Physical application of higher order homogeneous differential equations.		
3. Higher order Non-Homogeneous Differential Equations:	Solution of non homogeneous differential equations, Complementary function and particular integral, Physical of non homogeneous differential equations.		
<b>Section- B (Final Exam: 50 Marks)</b> <b>Group- A (20-Marks)</b>			
4. Series Solutions:	Solution of Bessel's, Legendre's Equation.		
5. Linear Differential Equations of second degree:	Linear differential Equation of second degree, Method of variation of parameter, Method of Undetermined coefficients, Physical application of differential equations.		
<b>Group-B (30 Marks)</b>			
6. Linear Partial Differential Equations of Order One	Origin of partial differential equations, Elimination of arbitrary constants and functions, Lagrange's method.		
7. Non-Linear Partial Differential Equations of Order One	Classification of integrals, Singular integral, General integrals, Charpit's method.		
8. Linear Partial Differential Equations of Order More than One:	Homogeneous partial differential equations with constant coefficients, Complementary function and particular integrals, Short method.		
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. Stroud ,K.A.(2013).<i>Engineering Mathematics</i>. Industrial Press, Inc..</li> <li>2. Ayrs ,F. <i>Differential Equation</i></li> <li>3. Stroud, K.A.(2014). <i>Further Engineering Mathematics</i>. Springer.</li> <li>4. Harma, B.D.(1971). <i>Differential Equations</i>. Krishna Prakashan Mandir.</li> <li>5. Sharma, G.K.(1971) <i>Differential Equations</i>. Krishna Prakashan Mandir.</li> </ol>		



<b>Course Code: UREL-1201</b>		<b>Course Title: Basic Principle of Islam</b>	
<b>Credit Hours: 1</b>		<b>Contact Hours: 2 per Week</b>	
<b>Objectives of the course :</b>	<ul style="list-style-type: none"> <li>To provide the students with proper knowledge and clear conception regarding the Islamic beliefs and comprehensive concept of 'Ibadah to develop their ethical understanding.</li> <li>To make them aware of the existing misconceptions &amp; traditional superstitions contradicting with the basic faith &amp; tenets of Islam.</li> <li>To enable the students to have the wide spread impacts of 'Ibadah on their lives and to inspire them to follow Islam in all walks of life.</li> </ul>		
<b>Section –A</b>			
<b>(Mid-term Exam: 30 Marks)</b>			
Chapter# 01	<i>Islam: An introduction: (a) Islam: Its definition and characteristic (b) Islamic 'Aqidah: Its definition and importance.</i>		
Chapter# 02	<i>Believe in Allah (SwT); Shirk; Belief in Allah's Angels (Malaikah); Belief in the Books of Allah:</i>		
Chapter# 03	<i>Belief in Allah's Prophets; Belief in the Akhirah (Life After Death); Belief in Qadr/ Taqdir (Fate) and divine decree; The nullifiers of Iman.</i>		
<b>Section-B (Final Exam: 50 Marks)</b>			
Chapter# 04	<i>'Ibadah: Meaning of 'Ibadah ; Objectives and aims of 'Ibadah and Conditions of 'Ibadah.</i>		
Chapter# 05	<i>Characteristics of 'Ibadah and signs of 'IbadurRahman; Signs of 'Ibadur Rahman (Servent of Ar- Rahman); Taharah&amp;Najasah; Taharah (purity) and Najasah (impurity)</i>		
Chapter# 06	<i>Pillars of Islam and Defense system of Islam: Salah (Prayer): Its significance, teachings &amp; some basic rules; Definition and kinds; How to perform the Salah in detail ?; Impact of Salah. Zakah (poor due) : Its significance, teachings &amp; some basic rules:</i>		
Chapter# 07	<i>Sawm (Fasting): Its significance, teachings &amp; some basic rules. Hajj (pilgrimage): Its significance, teachings &amp; some basic rules.</i>		
Chapter# 08	<i>Defense system of Islam</i>		
<b>Outcomes:</b> After completion of this course:			
<ol style="list-style-type: none"> <li>The students will be equipped with the knowledge and clear conception regarding the Islamic beliefs and comprehensive concept of 'Ibadah.</li> <li>They find themselves ethically developed ones.</li> <li>They will have inspiration to live their lives in accordance with Islamic guidance.</li> </ol>			
Recommended Boos	<ol style="list-style-type: none"> <li>Rafique Dr. Abu Bakr, Islam The Ultimate Religion (Book one) Islamic 'Aqidah', Chittagong: ABC Publications, 2002.</li> <li>Mohammad ShafiulAlamBhuiyan, The Fundamental Beliefs of a Pure Muslim, 1<sup>st</sup> edition, 2003.</li> <li>Sabiq, Assayed, Al-`Aqaeed Al- Islamiyah, Cairo, Al-Fathu Lil-IelamilArabi, 10th edition-2000.</li> <li>Bilal Philips, Dr. Abu Ameenah. The Fundamentals of Thwhid (Islamic Monotheism), International Islamic Publishing House.</li> <li>Farid, Ahmed, An Encounter with Islam, Dhaka: Islamic Foundation, BaitulMukarram, Dhaka, 1995</li> </ol>		



**SESSIONAL**

**Course Code: CE-1206**  
**Credit Hours: 1.5**

**Course Title: Concrete sessional**  
**Contact Course: 3 Hrs per week**

General discussion of preparation and properties of concrete. Tests for specific gravity, unit weight, moisture content, and absorption of coarse and fine aggregates; normal consistency and initial and final setting time. soundness and fineness test of cement; direct tensile and compressive strengths of cement mortar; gradation of coarse and fine aggregates; design and testing of a concrete mix, sampling and testing of bricks for absorption, unit weight, efflorescence and compressive strength.

**Course Code: CE-1208**  
**Credit Hours: 1**

**Course Title: Practical Surveying**  
**Contact Course: 2 weeks in the field**

**Course Content:** Practice on handling of instruments, chain survey, plane table survey, Theodolite traversing, Leveling and contouring, route project, house setting, curve setting, stadia surveying, height and distance problem.

**Course Code: CHEM-1206**  
**Credit Hours: 1.5**

**Course Title: Chemistry (Inorganic Quantitative analysis )**  
**Sessional Contact Hours: 3 Hrs per week**

Volumetric analysis: acidimetry-alkalimetry; titrations involving redox reactions, determination of Cu, Fe and Ca volumetrically; determination of Ca and Mg in water.

**Course Code: PHY-1206**  
**Credit Hours: 1.5**

**Course Title: Physics Sessional**  
**Contact Hours: 3 Hrs per week**

**Course Content**

1. Determination of line frequency by Lissajous figures using an oscilloscope and a function generator and verification of the calibration of time/div knob at a particular position for different frequencies;
2. Determination of frequency of a tuning fork by Melde's apparatus;
3. Determination of the spring constant and the effective mass of a loaded spring;
4. To draw magnetic induction versus current curve for a circular coil using Biot-Savart law and hence to verify tangent law;
5. Determination of the moment of inertia of a flywheel about its axis of rotation;
6. Determination of rigidity modulus of the material of a wire by static method;
7. Determination of the pressure-coefficient of air by constant volume air thermometer;
8. Determination of the thermal conductivity of a bad conductor by lee's method;
9. To plot the thermo-electromotive force vs temperature (calibration) curve for a given thermocouple (e5);
10. Determination of the melting point of a solid using the calibration curve obtained in experiment(e9);
11. Determination of the mechanical equivalent of heat by electrical method;
12. Determination of the focal length of (i) a convex lens by displacement method and (ii) a concave lens by an auxiliary lens method;
13. Determination of the radius of curvature of a plano-convex lens by Newton's ring method;
14. Determination of specific rotation of sugar solution by a polarimeter;



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الجامعة الإسلامية العالمية شيتاغونغ  
**International Islamic University Chittagong**  
**Department of Civil of Engineering (CE), FSE**

**THIRD  
SEMESTER**



## Third Semester

<b>Course Code: CE2301</b> <b>Credit Hours: 3</b>	<b>Course Title: Analytical Mechanics</b> <b>Contact Hours: 4Hrs per week</b>
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>	
<b>1. Introduction to Mechanics</b>	What is Mechanics? .Introduction to SI units. The concepts of a rigid body, Definitions and concepts of forces, Components of force, Classification of force systems.
<b>2. Free body diagrams</b>	Definition, Procedure for drawing free body diagrams, Two force members, Gravitation force, Reactions at supports and connections, Smooth surface.
<b>3. Coplanar forces</b>	Resultant of coplanar concurrent forces. Equilibrium of three forces. Joint-to Joint method, Moments of forces, Varignons theorem, Resultant and equilibrium of coplanar parallel forces, Couples and. Torque.
<b>Section- B (Final Exam: 50 Marks)</b> <b>Group- A (20-Marks)</b>	
<b>4. Noncurrent non-parallel coplanar forces and Non-coplanar forces</b>	Resultant of a general coplanar force system, Equilibrium of a general coplanar forces system, Trusses, Method of sections, Pin connected frames, Concurrent force in space, Couples in space. Non-coplanar parallel, non-concurrent, non-parallel forces in space.
<b>5. Friction</b>	Frictional forces. Limiting frictional forces. Coefficient of kinetic friction. Angle of friction. Wedge. Belt friction.
<b>Group B (30 marks)</b>	
<b>6. Centroids and Moment of Inertia</b>	Definitions. Centre of gravity. Mass centre and Centroids, Estimating location of Centroids. Theorems of Papous and Goldinus, Moment of inertia. Radius of Gyration. Transfer formula, Moment of inertia about inclined axes.
<b>7. Force system that produces rectilinear motion</b>	Displacement, speed, velocity &, acceleration, Angular velocity, Trajectory, Newton's law of motion. Component forces and accelerations, Motion of the centre of gravity of rigid body, Body in rectilinear translation.
<b>8. Work , Energy, Power, Impulse and Momentum</b>	Positive and negative works, Potential energy, Work of a couple, Kinetic energy of a rotating body, Frictional force in plane rolling., Power and Efficiency, Principle of impulse and momentum, Conservation of linear and angular momentum, Direct and oblique impact.
<b>Recommended Books:</b>	<ol style="list-style-type: none"> <li>1. Bhattacharyya, B.(2009). <i>Engineering Mechanics</i>. Oxford University Press,</li> <li>2. Hibbeler, R.C.(2012). <i>Engineering Mechanics</i>. Prentice Hall;</li> <li>3. Shames,I.H. (.2012). <i>Engineering Mechanics</i>. Prentice Hall;</li> <li>4. Harper, B. , Meriam, J.L, &amp; Kraige,L.G.(2006). <i>Engineering Mechanics</i>. Wiley.</li> <li>5. Meriam, J.L.&amp; Kraige, L.G.(2012). <i>Engineering Mechanics</i>. Wiley.</li> <li>6. Arthur P. Boreasi, A.P.,&amp; Schmidt,R.(2000). <i>Engineering Mechanics</i>. John Wiley and Sons Ltd.</li> </ol>



<b>Course Code: CE2303</b> <b>Credit Hours: 3</b>		<b>Course Title: Mechanics of Solids-1</b> <b>Contact Hours: 3Hrs per week</b>	
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>			
<b>1. Fundamental concepts of stress and strain</b>		Mechanical properties of materials;	
<b>2. Strain energy</b>	stresses and strains in member subjected to tension, compression		
<b>3. Shear and temperature changes.</b>			
<b>Section- B (Final Exam: 50 Marks)</b> <b>Group- A (20-Marks)</b>			
<b>4. Torsional stress</b>	Torsional stress in shafts and tubes with different cross section.		
<b>5. Helical springs</b>	Helical springs, stresses in thin walled pressure vessels.		
<b>Group B (30 marks)</b>			
<b>6. Bending moment and shear force diagrams of beams and frames,</b>			
<b>7. Flexural and shearing stresses in beam (Straight &amp; Curve), Shear flow and shear center, Inelastic Bending of Beams</b>			
<b>8. Thin walled pressure containers: riveted and welded Joints.</b>			
<b>Recommended Books:</b>	<ol style="list-style-type: none"><li>1. Gere, J.M., Timoshenko, S.P., &amp; Ayden, I. (1997). <i>Mechanics of Materials</i>. Pws Pub Co.</li><li>2. Bedford, A., &amp; Liechti, K.M. (2002). <i>Mechanics of Materials</i>. Prentice Hall.</li><li>3. Gere, J.M., &amp; Timoshenko, S.P. (1997). <i>Mechanics of Materials</i>. Pws Pub Co.</li><li>4. Vable, M. (2007). <i>Intermediate Mechanics of materials</i>. Oxford University Press.</li><li>5. Maugin, G.A, &amp; Kienzler, R. (2014). <i>Configurational Mechanics of Materials</i>. Springer</li><li>6. Beer, F.B, Johnston, J. Dewolf, J.T., &amp; Mazurek, D. (2012). <i>Mechanics of Materials</i>. McGraw-Hill</li></ol>		



<b>Course Code: CSE2303</b> <b>Credit Hours: 3</b>	<b>Course Title: Computer Programming and Numerical Methods in Civil Engineering, Contact Hours: 3Hrs per week</b>
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>	
1) <b>Basic components of computer systems</b> , Operating systems for Micro-computers, Flow network. 2) <b>Fortran language</b> : Development of Fortran programs and solution of problems using a computer, 3) <b>Applications</b> to Civil Engineering problems.	
<b>Section- B (Final Exam: 50 Marks)</b> <b>Group- A (20-Marks)</b>	
4) <b>Numerical solution</b> of algebraic and transcendental equations; Bisection method, Regular false method, 5) Newtown Raphson method, Iteration method (Rate of Convergence, Order of errors). Solution of systems of linear equations; Matrices, Gaussian elimination method, Gauss-Seidel iteration method.	
<b>Group B (30 marks)</b>	
6) Interpolation Simple difference tables, difference of a polynomial, Newton’s formulae for interpolation, central difference interpolation formula, central difference interpolation formula, 7) Divided difference. Tables of divided differences, Newton’s general interpolation formula, Lagrange’s interpolation formula, 8) Curve fitting by least squares. Numerical integration and differentiation. Numerical solution of differential equation. Picard’s method, Euler’s method and Runge-Kutta method.	
<b>Recommended Books:</b>	<ol style="list-style-type: none"><li>1. Scheldt, H. (1997). <i>Teach Yourself C</i>. McGraw-Hill,</li><li>2. Rao, G. S. (2007). <i>Numerical Analysis</i>. New Age. International (P) Ltd</li><li>3. Gottfried, B.S. (1996). <i>Theory and Problems of Programming with C</i>. McGraw-Hill</li><li>4. Lafore, R. (1993). <i>The Waite Group’s C Programming using Turbo C++</i>. Sams Publishing.</li><li>5. Kanetkar, Y. (2006). <i>Let Use C</i>. BPB Publications.</li><li>6. Scheldt, H. (1992). <i>Turbo C/C++: The Complement Reference</i>. McGraw-Hill.</li><li>7. Balagurusamy, E. (1994). <i>Programming in ANSI C</i>. McGraw-Hill.</li><li>8. Kernighan, C. &amp; Ritchie, D.M. (1988). <i>The C Programming Language</i>. Prentice Hall.</li><li>9. Deitel, H.M. ((2000). <i>How to program</i>. Prentice Hall.</li><li>10. Miller, W. (1984). <i>The Engineering of Numerical Software</i>. Prentice Hall</li><li>11. Jackson, K.R. (1974). <i>Simplified FORTRAN Guide</i>. John Wiley &amp; Sons</li></ol>



<b>Course Code: MATH-2305</b> <b>Credit Hours: 3</b> [Pre requisite: MATH-1205]	<b>Course Title: Math III (Probability &amp; Statistics Laplace Transform</b> <b>Contact Hours: 3 per Week</b>
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>	
<ol style="list-style-type: none"><li><b>1. Probability:</b> Definition, Laws of probability, Discrete and continues random variables, Mathematical expectation,</li><li><b>2. Conditional probability,</b> Probability distribution- Binomial, Poisson and Normal distribution.</li><li><b>3. Frequency Distribution of data:</b> Population and sample, Collection and presentation of statistical data, Tabulation of data, Class intervals,</li></ol>	
<b>Section –B (Final Examination: 50 Marks)</b> <b>Group-A-(20 marks)</b>	
<ol style="list-style-type: none"><li>4) Frequency distribution- Discrete, continuous and cumulative distributions, Histograms and frequency polygons, Graphical representation of data.</li><li>5) <b>Statistical measurements :</b> Central tendency- Arithmetic mean, Median, Mode, Geometric mean, Weighted average, Harmonic mean; Dispersion- Range, Standard deviation, Variance, Coefficient of variation, Moments, Skewness and Kurtosis.</li></ol>	
<b>Group-B-(30 marks)</b>	
<ol style="list-style-type: none"><li>6) <b>Correlation theory:</b> Linear correlation, Its measurement and significance. Regression and curve fitting: Linear and non-linear regression, Least Square method of curve fitting.</li><li>7) <b>Laplace Transforms:</b> Definition, Laplace transforms of different functions, Sufficient conditions for existence of Laplace transformations, Inverse Laplace transforms, Laplace transforms of derivatives; The unit step function, Periodic function,</li><li>8) Some special theorems on Laplace transforms, Partial fraction, Convolution, Solution of ordinary differential equations by Laplace Transform</li></ol>	
Recommended Books	<ol style="list-style-type: none"><li>1. Stroud ,K.A.(2013).<i>Engineering Mathematics</i>. Industrial Press, Inc..</li><li>2. Ayrs ,F. <i>Differential Equation</i></li><li>3. Stroud, K.A.(2014). <i>Further Engineering Mathematics</i>. Springer.</li><li>4. Harma, B.D.(1971). <i>Differential Equations</i>. Krishna Prakashan Mandir.</li><li>5. Sharma, G.K.(1971) <i>Differential Equations</i>. Krishna Prakashan Mandir.</li></ol>



<b>Course Code: ACC-2301</b> <b>Credit Hours: 2</b>	<b>Course Title: Financial and Managerial Accounting,</b> <b>Contact Hours: 2 per Week</b>
<b>Objectives</b>	In this course student will learn about 'Financial and Managerial Accounting' in regards to accounting and financial statement. book keeping system , errors correction in the trial balance, bank reconciliation statement, budget and planning.
<b>Section –A</b> <b>(Mid-term Exam. 30 Marks)</b>	
1. <b>Preliminaries:</b> Introduction to Accounting, History and development of accounting thought, types of accounting, Accounting Principles & ethics, Accounting Equation & Transaction Analysis. 2. <b>Introduction to Financial Statements:</b> Recording Business Transactions, The Accounts & their types. 3. <b>Double-Entry Book keeping System;</b> Invoice, discount from purchase price, purchase return and allowances, Sale of inventory, sales discount, sales returns and allowances; Journals, ledger & Trial balance.	
<b>Section –B (Final Examination: 50 Marks)</b> <b>Group-A-(20 marks)</b>	
4) <b>Correcting errors in the trial balance:</b> The Adjusting and Closing Procedure: The adjusting process, Accrual versus cash basis Accounting, Preparation of Adjusted trial balance and financial statements, Closing entries & Reversing entries. 5) <b>Using accounting information in decision-making.</b> Accounting in practice, Worksheet. Purchase book, sales book, cashbook, patty cashbook, etc. Control accounts and subsidiary accounts. Bank reconciliation statement.	
<b>Group-B-(30 marks)</b>	
6. <b>Cost In General:</b> Cost in general: objectives & classifications; Costing Journals; Job order costing, Process costing & Overhead costing, cost sheet; Cost of goods sold statement. 7. <b>Marginal &amp; Relevant costing</b> marginal costing tools and techniques, cost-volume-profit analysis. 8. <b>Guidelines for Decision-Making:</b> Budget, Capital budgeting; Planning, evaluation & control of capital expenditures.	
<b>Recommended Books</b>	1) Horngren, C.T., & Harrison, W.T. (2014). <i>Accounting</i> . Prentice Hall. 2) Matz, A., & Usry, M.F. (1988). <i>Cost Accounting- Planning and Control</i> . South-Western. 3) Sankar Prasad Basu, S.P., & Das, M. <i>Practice in Accountancy</i> . 4) Weygand, J.J., Kieso, D.E., & Kimmel, P.D. (2013). <i>Accounting Principles</i> . Wiley. 5) Smith, J.M., & Skousen, K.F. (1995). <i>Intermediate Accounting</i> . South-Western Pub



**SESSIONAL**

<b>Course Code: CE2302</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Analytical Mechanics Sessional</b> <b>Contact Hours: 3 Hours per week</b>
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<b>Roof Truss</b>	<ul style="list-style-type: none"><li>• To find the various forces in various parts of wall crane;</li><li>• To verify the line of polygon on various forces;</li><li>• To find coefficient of friction between various materials on inclined plan;</li><li>• To verify the principle of moment in the disc apparatus; Helical block ;</li><li>• To draw a load efficiency curve for a screw jack.</li></ul>
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<b>Course Code: CE2304</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Mechanics of Solids- 1 Sessional</b> <b>Contact Hours: 3 Hours per week</b>
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<b>Problems on stress, strain and mechanical properties of materials</b>	<ul style="list-style-type: none"><li>• Tension, direct shear and direct, shear and impact tests of mild steel specimens.</li><li>• Compressions test of timber and concrete specimens.</li><li>• Shear force and bending moment diagrams for practical structural components (e.g. stair-case, sunshade, bus stand shed etc.)</li><li>• Slender column test; static bending test, hardness test of metals; torsional test of different types of materials by torque Machine; Helical spring test, Determination of shear centre,</li><li>• Load deflection behavior of simple beams.</li></ul>
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<b>Course Code: CE2306</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Quantity Surveying Sessional</b> <b>Contact Hours: 3 Hours per week</b>
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<b>Course Contents</b>	<ul style="list-style-type: none"><li>• Earthwork excavation for roadway, earthwork computation from spot levels;</li><li>• estimation for residential building: estimation of slab, beam, column, footing; analysis of rates, specifications, costing of residential building;</li><li>• estimation and costing of septic tank; estimation and costing of underground water reservoir;</li><li>• estimation and costing of retaining wall; estimation and costing of slab culvert; estimation and costing of bridges; highways construction; estimation of steel truss; computer aided quantity estimation; construction site survey and estimation.</li></ul>
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<b>Course Code: CSE2304</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Computer Programming and Numerical Methods in Civil Engineering Sessional</b> <b>Contact Hours: 3Hrs per week</b>
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<b>Course Contents</b>	Operating system for microcomputers, development of FORTRAN programs and solution of problems using a computer, solution of Civil Engineering problems by microcomputers.
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<b>Course Code: URED-2302</b>		<b>Course Title: Science of Quran and Hadith,</b>	
<b>Credit Hours: 2</b>		<b>Contact Hours: 2 per Week</b>	
Objectives	The main objectives of this course are as follows: 1. To make the students familiar with the <i>Qur'an &amp; Sunnah</i> as these are the main sources of Islamic <i>Shari'ah</i> . 2. To achieve the main goal of the University in Islamization of Knowledge through enlightening the students with revealed knowledge of the <i>Qur'an</i> and <i>Sunnah</i> .		
<b>Course Outline:</b>			
<b>Section-A (Mid-term Exam: 30 Marks)</b>			
Chap# 01	Definition of the <i>Qur'an</i> Literally and Terminologically Central Subject Matter & the Main Themes of the Holy <i>Qur'an</i> and The necessity of the Holy <i>Qur'an</i> .		
Chap# 02	Wahi (Revelation) of the Holy <i>Qur'an</i> : Meaning of <i>Wahi</i> ; Stages of revelation of the Holy <i>Qur'an</i> and the First and the Last Revelation.		
Chap# 03	The Ayah and Surah of the Holy <i>Qur'an</i> : Definition of <i>Aayah</i> ; The Arrangement of the Ayah of the Holy <i>Qur'an</i> ; The Arrangement and classification of <i>Surah</i> of the Holy <i>Qur'an</i> .		
<b>Section-B (Final Exam: 50 Marks)</b>			
Chap# 04	The Definition of Makki and Madani (2) The Characteristics of Makki and Madani Revelations (3) The benefits of knowing Makki and Madani.		
Chap# 05	Preservation & Compilation of the Holy <i>Qur'an</i> ; The Definition of Asbabunnuzul. The classification of Asbabunnuzul. The benefits of Knowing Asbanunnuzl.		
Chap# 06	Definition and Classifications of <i>Naskh</i> . The benefits of knowing <i>Nasikh</i> and <i>Mansukh</i> . Definition of <i>I'jaz</i> . The Proofs of <i>I'jaz</i> . Various aspects of <i>I'jaz Al-Qur'an</i> .		
Chap# 07	Difference among <i>Qur'an, Sunnah</i> and Hadith Qudshi; Explanation of some important terms of <i>Sunna</i> ; and Collection & Compilation of <i>Sunnah</i> .		
Chap# 08	The classification of <i>Hadith and and</i> Fabrication in Hadith.		
<b>After completion of this course:</b>			
1. <i>The students will have knowledge of the status of Qur'anic verses and Hadiathic text.</i> 2. <i>They will be able to establish the authenticity of Qur'an and Sunnah.</i> 3. <i>To have inspiration to achieve knowledge from the Qur'an and Sunnah directly.</i>			
<b>Recommended Books</b>	1) Denffer, Ahmad, vol. <i>'Ulum Al-Qur'an: An Introduction to the Sciences of the Qur'an</i> , The Islamic Foundation, UK, reprinted by – A.S. Noordeen, Kuala Lumpur. 1983. 2) Ushama, Dr. Thameem, <i>Sciences of the Qur'an: An Analytical Study</i> , International Islamic University Malaysia, Cooperative Limited, Kuala Lumpur. 1998. 3) Al-Azami, Dr Mohammad Mustafa, <i>Studies in Early Hadith Literature</i> , American Trust publication, Indiana, 1978. 4) Hasan, Dr. Suhaib, <i>An Introduction to the Science of Hadith</i> , London, AL-Quran Society, 1994		



আন্তর্জাতিক ইসলামী বিশ্ববিদ্যালয় চট্টগ্রাম  
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**Department of Civil of Engineering (CE), FSE**

**FOURTH  
SEMESTER**



## THEORY

<b>Course Code: CE-2403</b> <b>Credit Hours: 3</b>	<b>Course Title: Fluid Mechanics</b> <b>Contact Hours; 3 Hrs per week</b>
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>	
Development and scope of fluid mechanics, Fluid properties, fluid statics: fluid pressure and its measurement, Application of hydrostatics.	
<b>Section –B (Final Examination: 50 Marks)</b> <b>Group-A-(20 marks)</b>	
Equilibrium of floating body, fluid mass subjected to acceleration, fundamentals of fluid flow; measurement of fluid flow. Venturimeters, nozzles and pivot tubes,	
<b>Group-B-(30 marks)</b>	
Bernoulli's equation. Orifice, Mouthpiece, Notch, Weirs. Flow through closed conduits. Pipes in series and parallel, pipe networks. Viscous flow. Dimensional analysis and similitude.	
<b>Recommended Books:</b>	<ol style="list-style-type: none"><li>1. Kundu, P.K.,&amp; Cohen,I.M.(2011). <i>Fluid Mechanics</i>. Academic Press</li><li>2. Pue, J.L. <i>Fluid Mechanics</i>.</li><li>3. Cengel, Y.A., &amp; Cimbala, J.M.(2004). <i>Fluid Mechanics</i> .McGraw-Hill</li><li>4. Swaffield, J.A.,Gasiorek,J.M,&amp;Douglas,J.F.(1995).<i>Fluid Mechanic</i>.Longman Pub Group.</li><li>5. Spurk, J. H.,&amp; Mayes,C.(1997). <i>Fluid Mechanics</i>. Springer;</li><li>6. Irfan A. Khan.(1995). <i>Fluid Mechanics</i> .Oxford University.</li><li>7. Granger,R.A.(1995). <i>Fluid Mechanics</i>. Dover Publications.</li></ol>



<b>Course Code: CE2405</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Engineering Geology &amp; Geomorphology,</b> <b>Contact Hours: 3 Hours per Week</b>
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>	
1) Mineralogy: Identification of minerals, common rock forming minerals, physical properties of minerals. 2) Mineraloids: Common rock forming minerals, types of rock, cycle of rock change, fold, fault and joint, 3) Earthquake & seismic map of Bangladesh, Sedimentation and metamorphism,	
<b>Section –B</b> <b>(Final Examination: 50 Marks)</b> <b>Group-A-(20 marks)</b>	
4) Structural Geology: Faults, type of Faults, dome and basin, 5) Weathering & erosional process: Quantitative analysis of erosional land forms, land subsidence, land slide.	
<b>Group-B-(30 marks)</b>	
6) Type of Drainage, Qualitative & Qualitative Analysis of drainage basins, Geological works done by Rivers and winds, Geological investigation of dams, reservoir, tunnels & highway sites. 7) Geological succession of Bangladesh, folded bed in Bangladesh, Faulting in Bangladesh, Mineral deposits of Bangladesh. 8) <b>Geomorphology</b> : Channel development, channel widening, valley shape, stream terraces: channel pattern and river basins, channel morphology, drainage pattern, geology and geomorphology of Bangladesh	
<b>Recommended Books</b>	1. Miller, F.P., Vendome, A.F.,& McBrewster, J. <i>Engineering Geology</i> 2. Bell, F.G. (2007). <i>Engineering Geology</i> . Butterworth-Heinemann 3. Johnson, R.B., & DeGraff, J.V..(1998). <i>Principles of Engineering Geology</i> . Wiley. 4. Hencher, S.(2012). <i>Practical Engineering Geology</i> . CRC Press. 5. Bell, F.G.(2007). <i>Engineering Geology and construction</i> . Butterworth-Heinemann. 6. West, T.R.(2010). <i>Geology Applied to Engineering</i> . Waveland Press Inc. 7. Waltham, T.(2009). <i>Foundations of Engineering</i> . CRC Press. 8. Tunneling Association of Canada.(1998). <i>Foundations of Engineering Geology: A Global View</i> . CRC Press



<b>Course Code: CE2407</b> <b>Credit Hours: 3</b>	<b>Course Title: Engineering Geology &amp; Geomorphology,</b> <b>Contact Hours: 3 Hours per Week</b>
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>	
<ol style="list-style-type: none"> <li>1. Introduction to Geotechnical Engineering, formation. type and identification of soils.</li> <li>2. Soil composition, soil grain &amp; aggregate, Clay mineralogy,</li> <li>3. Weight, volume &amp; moisture-density relationship,</li> </ol>	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A (20 Marks)</b>	
<ol style="list-style-type: none"> <li>4. Soil structure &amp; fabric, Index properties of soil,</li> <li>5. Engineering classification of soils, soil compaction,</li> </ol>	
<b>Group-B (30 Marks)</b>	
<ol style="list-style-type: none"> <li>6. Principles of total &amp; effective stresses, soil-water, Permeability and Seepage, capillarity &amp; flow nets,</li> <li>7. Stress distribution, Soil compaction, One-dimensional consolidation, Stress-strain-strength characteristics of soil,</li> <li>8. Compressibility and settlement behavior of soils.</li> </ol>	
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. Woodford, C.H., Passaris, E.K.S., &amp; Bull, J.W. (1998). <i>Engineering Analysis Using PAFEC Finite Element Software</i>. CRC Press.</li> <li>2. Miller, F.P., Vandome, A.F., &amp; McBrewster, J. <i>Geotechnical Engineering</i></li> <li>3. Spigolon, S.J. (2001). <i>Geotechnical Engineering</i>. McGraw-Hill.</li> <li>4. Lancellotta, R. (1208). <i>Geotechnical Engineering</i>. CRC Press.</li> <li>5. Das, B. M. (2013). <i>Geotechnical Engineering</i>. Cengage Learning;</li> <li>6. Dirnberger, M.M. (2009). <i>Practical Geotechnical Engineering Design</i>. McGraw-Hill.</li> <li>7. Das, B. M. (2010). <i>Geotechnical Engineering Handbook</i>. J. Ross Publishing, 2010.</li> </ol>

<b>Course Code: CE2409</b> <b>Credit Hours: 3</b>	<b>Course Title: Design of Concrete Structure-I</b> <b>Contact Hours: 3 Hours per Week</b>
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>	
Fundamental behavior of reinforced concrete, Analysis and design of singly reinforced beam,	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A (20 Marks)</b>	
Doubly reinforced beam and T-beam according to WSD and USD methods.	
<b>Group-B (30 Marks)</b>	
Diagonal tension, bond and anchorage according to WSD and USD methods, Analysis and design of one way and two-way slabs by co-efficient method, Introduction to fibrocement design per BNBC.	
<b>Recommended Books:</b>	<ol style="list-style-type: none"> <li>1. Nilson &amp; Winter. (2009). <i>Design of concrete structures</i>. McGraw-Hill.</li> <li>2. Khan &amp; Rahman. <i>Reinforced Concrete Manual &amp; Building Plan</i>.</li> <li>3. Gambhir, M. L. <i>Design of reinforced concrete structures</i>.</li> <li>4. Kumar, S. (2009). <i>Treasure of R.C.C Designs</i>. Standard Book House.</li> </ol>



<b>Course Code: MATH-2405</b>		<b>Course Title: Design of Concrete Structure-I</b>	
<b>Credit Hours: 3 [Pre requisite: MATH- 1201]</b>		<b>Contact Hours: 3 Hours per Week</b>	
<b>Objectives</b>	In this course student will learn about 'Mathematics' in regards to vector spaces and subspaces , basis and dimension and linear mappings , inner product spaces, matrix and linear system of equations, characteristic equation and diagonalization, vector analysis, del operator, vector integration and vector's theorem.		
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>			
<ol style="list-style-type: none"> <li><b>1. Vector Spaces and Subspaces:</b> Definition of vector spaces , subspaces, basic theorem, Linear combinations of vectors, spanning set, Linear dependence and independence of vectors.</li> <li><b>2. Basis, Dimension, and Linear Mappings:</b> Basis and Dimensions of Vector spaces, Sums and Direct sums of subspaces. Mappings, Linear mappings, Kernel and image of a linear mapping, Singular and nonsingular mappings, Linear mapping and systems of linear equations.</li> <li><b>3. Inner Product Spaces:</b> Inner product spaces, Cauchy-Schwarz inequality, Orthonormal sets, Gram-Schmidt orthogonalization process, Application of Linear algebra in electric network.</li> </ol>			
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A(20 Marks)</b>			
<ol style="list-style-type: none"> <li><b>4. Matrix and Linear System of Equations:</b> Vector presentation by matrix, different types of matrices, algebraic operations on matrices, adjoint and inverse of a matrix, augmented matrix, row operation method, rank of Matrices, some problems, Normal Vector, Ortho normal Vectors, Orthogonality, Echelon form, consistency and inconsistency, solution of homogeneous and non- homogeneous linear system of equations.</li> </ol>			
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A(20 Marks)</b>			
<ol style="list-style-type: none"> <li><b>5. Characteristic equation and Diagonalization:</b> Eigen values and eigenvectors, characteristic polynomial, Caley-Himilton theorem, Diagonalization of matrices and symmetric matrices, Characteristics roots.</li> </ol>			
<b>Group-B (30 Marks)</b>			
<ol style="list-style-type: none"> <li><b>6. Vector analysis:</b> Scalar and vectors, operation of vectors, vector addition and multiplication - their applications. Scalar Field, Vector Field, Dot Product, Cross product, Triple Product, Derivative of vectors and problems.</li> <li><b>7. Del operator and Vector Integration:</b> Del operator, gradient, divergence and curl and their physical significance, Line Integrals, physical significance of Vector integration and Problems.</li> <li><b>8. Vector's Theorem :</b> Greens, Gauss &amp; Stocks theorem and their applications, Vector components in spherical and cylindrical systems.</li> </ol>			
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. Lipschutz, S. Linear Algebra.</li> <li>2. Spiegel ,M.R. Vector Analysis</li> <li>3. Chattarjee, P.N. Matrices</li> <li>4. Bronson, R. Linear algebra.</li> <li>5. Schaum's Outline Series. Matrices.</li> </ol>		

<b>Course Code: URBL-2401</b>	<b>Course Title: Functional Bengali Language</b>
<b>Credit Hours: 2</b>	<b>Contact Hours: 2 Hours per Week</b>



## SESSIONAL

<b>Course Code: CE2404</b> <b>Credit Hours: 1.5</b>		<b>Course Title: Fluid Mechanics Sessional,</b> <b>Contact Hours: 3 Hours per Week</b>	
<b>Course Content</b>	Center of pressure, proof of Bernoulli's theorem, flow through venturimeter, flow through orifice and mouthpiece, concept of velocity by co-ordinate method, flow through mouthpiece, flow over V-notch, fluid friction in pipes, flow over sharp-crested weir.		

<b>Course Code: CE2408</b> <b>Credit Hours: 1.5</b>		<b>Course Title: Geotechnical Engineering Sessional</b> <b>Contact Hours: 3 Hours per Week</b>	
<b>Course Content</b>	<ul style="list-style-type: none"><li>• Field identification tests of soils, Specific gravity test, Atterberg limits test, Grain size analysis by sieve &amp; hydrometer, Relative density test, Field density test, Permeability test, Compaction test, Unconfined compression test, Direct shear test, Consolidation tests.</li><li>• Test of geotextiles.</li></ul>		

<b>Course Code: CE2410</b> <b>Credit Hours: 1.5</b>		<b>Course Title: Concrete Structures Design-1 Sessional</b> <b>Contact Hours: 3 Hours per Week</b>	
<b>Course Content</b>	Analysis and design problems based on CE 2408; design of slab bridge, balanced cantilever bridge and low rise building.		



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الجامعة الإسلامية العالمية شيتاغونغ  
**International Islamic University Chittagong**  
**Department of Civil of Engineering (CE), FSE**





**THEORY**

<b>Course Code: CE-3501</b> <b>Credit Hours: 3</b> ([Pre requisite: MATH- 1201])	<b>Course Title: Mechanics of Solids-II</b> <b>Contact Hours: 3 Hours per Week</b>
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>	
Bolted Riveted and welded joints, shear centre, Compound stresses; Transformation of stress Failure criteria; Elastic strain energy and external work	
<b>Section- B (Final Exam: 50 Marks)</b> <b>Group- A (20-Marks)</b>	
Beam deflection by direct integration, Moment area method and Conjugate beam method,	
<b>Group- B (30-Marks)</b>	
Elastic load method, Buckling of Columns, Symmetric and unsymmetric bending of beams Flexural and shear stress in beams due to unsymmetrical bending, Cable and cable supported structures	
<b>Recommended Books:</b>	<ol style="list-style-type: none"> <li>1. Ling, H.I., Leshchinsky , D., &amp; Tatsuoka, F .(2003). <i>Reinforced Soil Engineering Advances in Research and Practice</i>. CRC Press.</li> <li>2. Foster, M.S.(2007). <i>Materials of Industry – Their Distribution and Production</i>. Brunauer Press.</li> <li>3. Sullivan, J. (2002). <i>Structural Engineering Compendium</i>. Elsevier.</li> <li>4. Westinghouse, G.(2007). <i>Science and Civilization – Vo11</i> Mason Press.</li> </ol>

<b>Course Code: CE-3503</b> <b>Credit Hours: 3</b> [Pre requisite: MATH- 1201])	<b>Course Title: Open Channel Flow</b> <b>Contact Hours: 3 Hours per Week</b>
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>	
<ol style="list-style-type: none"> <li>1. Open channel flow and it's classification, Properties of open Channel, Velocity and pressure distributions,</li> <li>2. Energy equation and momentum principles, specific energy and transition problems,;</li> <li>3. Critical flow and control, principles of flow measurement and devices; its computation and application,</li> </ol>	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A (20 Marks)</b>	
<ol style="list-style-type: none"> <li>4. Concept of uniform flow, development of uniform flow, Chezy and Manning equations,</li> <li>5. Estimation of resistance coefficients and computation of uniform flow, Design of channels for uniform flow, gradually varied flow.</li> </ol>	
<b>Group-B (30 Marks)</b>	
<ol style="list-style-type: none"> <li>6. Theory and Analysis, Rapidly varied flow, Introduction, flow over spillways.</li> <li>7. Momentum equation and specific momentum Hydraulic jump theory and its use as energy dissipation,</li> <li>8. Channel design by regime concept method: Lacey method and Kennedy method with respect to Bangladesh.</li> </ol>	



<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. Chow, V.T. (2009). <i>Open Channel Hydraulics</i>. The Blackburn Press.</li> <li>2. French, R.H. (2007). <i>Open Channel Hydraulics</i>. Water Resources Publication.</li> <li>3. Daugherty, R.L., Franzini, J.B., &amp; Finnemore, E.J. (1985). <i>Fluid Mechanics with Engineering Applications</i>. Mcgraw-Hill.</li> <li>4. Michael, A.M. (2007). <i>Irrigation Theory and Practice</i>. Vikas Publication House.</li> <li>5. D.B. Kraatz, D.B., &amp; Mahajan, I.K. (1975). <i>Small hydraulic structures (FAO Irrigation Drainage paper)</i>. UNO.</li> <li>6. Sutradhar. , S. C. <i>Principles of Design of Drainage Sluice</i>.</li> </ol>
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<b>Course Code: CE-3505</b> <b>Credit Hours: 3</b>	<b>Course Title: Transportation Engineering-I: (Transportation Planning and Traffic Engineering)</b> <b>Contact Hours: 3 Hrs per Week</b>
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<b>Section-A</b> <b>(Mid-term Exam:30 Marks)</b>	
<ol style="list-style-type: none"> <li>1. Transportation engineering, transportation functions; transportation systems, functional components,</li> <li>2. Factors in transportation development, transportation modes, public transportation, emerging modes;</li> <li>3. Intelligent transportation system: components and applications;</li> </ol>	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A(20 Marks)</b>	
<ol style="list-style-type: none"> <li>5. Transport planning: concepts, scope and hierarchy, process, goals and objectives, inventories, socio-economic activities,</li> <li>6. Land use-transport interaction, travel demand forecasting; road safety and accident analysis.</li> </ol>	
<b>Group-B (30 Marks)</b>	
<ol style="list-style-type: none"> <li>7. Geometric design of highways: design controls and criteria, cross sectional elements, alignment, sight distance, intersection and interchange layouts, planning and design of bicycle and pedestrian facilities;</li> <li>8. Traffic engineering: fundamentals of traffic engineering, vehicle and traffic characteristics, traffic control devices and systems, traffic studies, planning and design of parking facilities, roadway lighting;</li> <li>9. Transportation in Bangladesh: transportation modes and networks, constraints and challenges, transport demand and modal share, road classification and design standards.</li> </ol>	
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. James T. Ball. (2001). <i>Transportation Engineering</i>. McGraw-Hill.</li> <li>2. Papacostas, C.S., &amp; Prevedouros, P.D. (2007). <i>Transportation Engineering and Planning</i>. Prentice Hall of India.</li> <li>3. Khisty, C.J., &amp; Lall, B. K. (2002). <i>Transportation Engineering and Introduction</i>. Prentice Hall.</li> <li>4. Murthy, N.A.S., &amp; Mohle, R. (2000). <i>Transportation Engineering Basics</i>. American Society of Civil Engineers.</li> <li>5. Banks, J.B. (2001). <i>Introduction to Transportation Engineering</i>. McGraw-</li> </ol>



	<p>Hill.</p> <p>6. Kutz, M. (2011). <i>Handbook of Transportation Engineering</i>. McGraw-Hill.</p> <p>7. Pagnette, R.J., &amp; Wright, P.H. (1982). <i>Transportation Engineering planning and Design</i>. John Wiley &amp; Sons Inc.</p> <p>8. Qiu, Y., Luo, X., Wang, K.C.P., &amp; Shuai, B. (2009). <i>International Conference on Transportation Engineering</i>. American Society of Civil Engineers.</p> <p>9. Macpherson, G. (1993). <i>Highway and Transportation Engineering and planning</i>. John Wiley.</p> <p>10. Hoel, L.A., &amp; Garber, N. (2007). <i>Transportation Infrastructure Engineering: A Multimodal Integration</i>, Engage Learning.</p> <p>11. Bazzan, A., &amp; Klugl, F. (2009). <i>Multi-agent Systems for Traffic and Transportation Engineering</i> Information Science Reference.</p> <p>12. Cascetta, E. (2001). <i>Transportation systems Engineering; Theory and Methods</i>. Kluwer Academic</p>
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<b>Course Code: CE-3507</b>	<b>Course Title: Structural Analysis &amp; Design-I</b>
<b>Credit Hours: 3</b>	<b>Contact Hours: 3 Hrs per Week</b>
<b>.Section-A</b>	
<b>(Mid-term Exam:30 Marks)</b>	
Stability and determinacy of structures, Analysis of statically determinate beams & girders,	
<b>Section-B (Final Exam: 50 Marks)</b>	
<b>Group-A(20 Marks)</b>	
Analysis of statically determinate frames, trusses, space trusses, flexible chord,	
<b>Group-B (30 Marks)</b>	
Cables and cables supported structures, Influence lines, Moving loads on beams, frames & trusses.	
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>Norris, Wilbur, &amp; Utku. (1976). <i>Elementary Structural Analysis</i>. McGraw Hill.</li> <li>Shedd, &amp; Vawter. (1957). <i>Theory of simple structures</i>. John Wiley&amp; Sons.</li> <li>Surhone, L.M., Tennoe , M.T., &amp; Henssonow, F.(1998). <i>Structural Analysis</i>. Wiley-Blackwell.</li> <li>Ray, S.S.(1998). <i>Structural Steelwork: Analysis and Design</i>. Wiley-Blackwell.</li> <li>Bangash, M.Y.H., &amp; Staircases, T.B.(1999). <i>Structural Analysis and Design</i>. Taylor &amp; Francis</li> <li>Rajan,S.(2000). <i>Introduction to structural analysis and Design</i>. Wiley.</li> <li>Durka,F., Moran,W., Nageim, H.A.,&amp; Williams,D.T.(2011). <i>Structural Mechanics: Loads, Analysis, Design and Materials</i>. Prentice Hall.</li> <li>Clive L. Dym,C.L. <i>Structural Modeling and Analysis</i>. Cambridge University Press.</li> <li>Kotsovos, M.D.,&amp; Pavlovic, M.N.(1995). <i>Structural Concrete: Finite element Analysis for Limit-state Design</i>. Thomas Telford Publishing.</li> </ol>



<b>Course Code: ECON-3501</b>		<b>Course Title: Engineering Economics</b>	
<b>Credit Hours: 2</b>		<b>Contact Hours: 2 Hrs per Week</b>	
<b>Objectives</b>	In this course student will learn about 'Principle of Economics' in regards to the basic idea in micro and macro economics, production and market, economic policy, economics of development and planning.		
<b>Section-A</b> <b>(Mid-term Exam:30 Marks)</b>			
<b>1. Introduction:</b> Definition of economics, Scope and utility of studying economics. <b>2. Micro-economics:</b> The theory of demand and supply and their elasticity, Price determination, Nature of an economic theory, applicability of economic theories to the problems of developing countries. Indifference curves technique, Marginal utility analysis, <b>3. Production:</b> Production function, types of productivity, The nature of Isoquants and Isocosts, Rational region of production of an engineering firm. Euler's theorem.			
<b>Section- B (Final Exam: 50 Marks)</b> <b>Group- A (20-Marks)</b>			
<b>4. Market:</b> Concepts of market and market structure. Cost analysis and cost function. Small scale production and large-scale production, Optimization, Theory of distribution. <b>5. Macroeconomics:</b> Savings, investment, employment, National income analysis, Inflation.			
<b>Group-B (30 Marks)</b>			
<b>6. Economic Policy:</b> Monetary policy, Fiscal policy and trade policy with reference to Bangladesh. <b>7. Economics of development:</b> Dimensions of development, Relevance of theory, the employment problem, Human resource development <b>8. Economics of planning:</b> Planning and market, Policy models, Planning experience.			
<b>Recommended Books</b>	1. Leftwich, R. (1979). <i>The Price System and Resource Allocation</i> . Dryden Press. 2. Samuelson, P.A. (2009). <i>Economics</i> . McGraw-Hill. 3. Stigler, G.J. (1956). <i>The Theory of Price</i> . The Macmillan Co. 4. McConnell, & Brue, L. (2011). <i>Economics, Principles, Problems &amp; Policies</i> . McGraw-Hill		



<b>Course Code: URIS – 3503</b> <b>Credit Hours: 1</b>	<b>Course Title: Introduction to Political Thought and Social Behavior, Contact Hours: 1 Hr per Week</b>
Objectives of this course is designed:	
1.To provide the students with basic idea concerning the political thoughts and social justice. 2.To inculcate in them Islamic manners and etiquettes for their development as a human being. 3.To discharge their duties and responsibilities towards Allah (SWT) and His creatures.	
<b>Section-A (Mid-term Exam: 30 Marks)</b>	
Chapter-1	Dealings and Behavior in Islam (Mu'amalah): Its Meaning, Definition and Scope.
Chapter-2	Family life in Islam:
Chapter-3	Principles of Islamic Economic System:
<b>Section-B (Final Exam: 50 Marks)</b>	
Chapter-4	Political System: Definition, Principals, Islamic, Islamic State, Islamic monuments.
Chapter-5	Dress code in Islam for male and female
Chapter-6	Duties and obligations towards: Relatives, Neighbors, Guests, Needy and Orphan.
Chapter-7	Basic virtues and Islam.
Chapter-8	Social Manners.
Recommended Books	<ol style="list-style-type: none"><li>1. Hamidullah, <i>Introduction to Islam</i>. Lahore: Published by: Sh. Muhammad Ashraf.</li><li>2. Al-Qaradawi, Y. <i>Introduction to Islam</i>, Islamic Inc.</li><li>3. Sarwar, G. <i>Islam: Beliefs and Teachings</i>, IIUI, Pakistan.</li><li>4. Shah, A.H. (1995). <i>Social Laws of Islam</i>. Dhaka: BIIT.</li><li>5. Zino, M. J. (1996). <i>Islamic Guidelines</i>. Darussalam, Riyadh.</li><li>6. Abdalati, H. (1977). <i>The Family Structure in Islam</i>. American Trust Publications.</li><li>7. Abdalati, H. (1996). <i>Islam in Focus</i>. 2<sup>nd</sup> Ed. U.S.A: Islamic Teaching Centre.</li></ol>



## SESSIONAL

<b>Course Code: CE-3502</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Construction detailing and Estimation Sessional</b> <b>Contact Hours: 3 Hours per Week</b>
<b>Course Content</b>	Detailed estimate of all items of work of a building, details estimate of all items of work of a bridge, truss, culvert and a simple girder bridge.

<b>Course Code: CE-3504</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Open Channel Flow Sessional</b> <b>Contact Hours: 3 Hours per Week</b>
<b>Course Content</b>	Broad-crested weir; sluice gate; venture flume; parshall flume; cutthroat flume; hydraulic jump; velocity distribution profile; Manning's roughness coefficient; specific force and specific energy.

<b>Course Code: CE-3506</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Transportation Engineering I (Materials and Traffic Engineering) Sessional, Contact Hours: 3 Hours per Week</b>
<b>Course Content</b>	Testing and quality control of highway materials, Test on bituminous materials, Tests on sub-grade, Sub-base and base materials. Bituminous mix design, Roadway capacity studies' problems on the design of roadway geometry and pavements, application of analytical, simulation and statistical packages.



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**International Islamic University Chittagong**  
**Department of Civil of Engineering (CE), FSE**

**SIXTH  
SEMESTER**



## THEORY

<b>Course Code: URIS – 3601</b> <b>Credit Hours: 3</b>	<b>Course Title: Foundation Engineering</b> <b>Contact Hours: 3 Hrs per Week</b>
<b>Section-A</b> <b>(Mid-term Exam: 30 Marks)</b>	
Soil investigation techniques: Techniques of sub-surface investigation, direct measurement of consistency and relative density, correlation of strength parameters with N-Values Techniques of sub-surface investigation,	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A (20 Marks)</b>	
Lateral earth pressure, stress distribution, Settlement computation, types of foundations	
<b>Group-B (30 Marks)</b>	
Bearing capacity of shallow & deep foundation, settlement & distortion of foundation. Design and construction of footings, rafts and piles; slope stability analysis	
<b>Recommended Books</b>	<ol style="list-style-type: none"><li>1. Woodford, C.H., Passaris, E.K.S., &amp; Bull, J.W.(1998). <i>Engineering Analysis Using PAFEC Finite Element Software</i>. CRC Press.</li><li>2. Spigolon, S.J.(2001). <i>Geotechnical Engineering</i>. McGraw-Hill.</li><li>3. Lancellotta, R. (2008). <i>Geotechnical Engineering</i>. CRC Press.</li><li>4. Das, B.M. (2013). <i>Geotechnical Engineering</i>. Engage Learning.</li><li>5. Dimberger, M.M.(2009). <i>Practical Geotechnical Engineering Design</i>. McGraw-Hill.</li></ol>

<b>Course Code: CE-3603</b> <b>Credit Hours: 3</b>	<b>Course Title: Design of Concrete Structure-II</b> <b>Contact Hours: 3 Hrs per Week</b>
<b>Section-A</b> <b>(Mid-term Exam: 30 Marks)</b>	
Review of codes, Analysis and design of columns, introduction to floor systems; footings, retaining walls, piles and pile caps according to USD and WSD methods	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A (20 Marks)</b>	
Analysis and design of members subjected to torsion. Deep beam, flat plate, Flat slab design by Direct Design method and Equivalent frame method.	
<b>Group-B (30 Marks)</b>	
Limit state design & yield-line theory. Design of joints, Brackets and corbels, Introduction to pre stressed concrete, Analysis preliminary design of prestressed beam section.	



<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. Surhone, L.M., Tennoe, M.T., &amp; Henssonow, F. (1998). <i>Structural Analysis</i>.</li> <li>2. Ray, S.S. (1998). <i>Structural Steelwork: Analysis and Design</i>. Wiley-Blackwell.</li> <li>3. Bangash, M.Y.H., &amp; Staircases, T.B. (1999). <i>Structural Analysis and Design</i>. Taylor &amp; Francis.</li> <li>4. Rajan, S. (2000). <i>Introduction to structural analysis and Design</i>. Wiley.</li> <li>5. Durka, F., Moran, W., Nageim, H.A., &amp; Williams, D.T. (2011). <i>Structural Mechanics: Loads, Analysis, Design and Materials</i>. Prentice Hall.</li> <li>6. Dym, C.L. <i>Structural Modeling and Analysis</i>. Cambridge University Press.</li> <li>7. Kotsovos, M.D., &amp; Pavlovic, M.N. (1995). <i>Structural Concrete: Finite element Analysis for Limit-state Design</i>. Thomas Telford Publishing</li> </ol>
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<b>Course Code: CE-3605</b>	<b>Course Title: Structural Analysis &amp; Design-II</b>
<b>Credit Hours:1.5</b>	<b>Contact hours: 3 Hrs per Week</b>
<b>Section-A</b> <b>(Mid-term Exam:30 Marks)</b>	
Aproximate analysis of statically indeterminate structures (e.g. braced trusses, portal trames, mill bent and multi-storied building frames),	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A(20 Marks)</b>	
Portal frames and multistoried building frames under the act of vertical dead and live load and lateral loads.	
<b>Group-B (30 Marks)</b>	
Wind and earthquake forces as per BNBC-93 code, deflection of trusses by virtual work method. Analysis of statically indeterminate structure by three-moment equations.	
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. Norris, Wilbur, &amp; Utku. (1976). <i>Elementary Structural Analysis</i>. McGraw Hill.</li> <li>2. Shedd &amp; Vawter. (1957). <i>Theory of simple structures</i>. John Wiley &amp; Sons.</li> <li>3. Surhone, L.M., Tennoe, M.T., &amp; Henssonow, F. (1998). <i>Structural Analysis</i>. Wiley-Blackwell.</li> <li>4. Ray, S.S. (1998). <i>Structural Steelwork: Analysis and Design</i>. Wiley-Blackwell.</li> <li>5. Bangash, M.Y.H., &amp; Staircases, T.B. (1999). <i>Structural Analysis and Design</i>. Taylor &amp; Francis.</li> <li>6. Rajan, S. (2000). <i>Introduction to structural analysis and Design</i>. Wiley.</li> <li>7. Durka, F., Moran, W., Nageim, H.A., &amp; Williams, D.T. (2011). <i>Structural Mechanics: Loads, Analysis, Design and Materials</i>. Prentice Hall.</li> <li>8. Dym, C.L. <i>Structural Modeling and Analysis</i>. Cambridge University Press.</li> <li>9. Kotsovos, M.D., &amp; Pavlovic, M.N. (1995). <i>Structural Concrete: Finite element Analysis for Limit-state Design</i>. Thomas Telford Publishing.</li> </ol>



<b>Course Code: CE-3607</b> <b>Credit Hours: 3</b>	<b>Course Title: Environmental Engineering: (Water source, distribution and treatment) Contact Hours: 3 Hrs per Week</b>
<b>Section-A</b> <b>(Mid-term Exam: 30 Marks)</b>	
1. Introduction to Environmental Engineering: ecology and environment; climate change; biodiversity. Sanitation and health, population prediction & water requirement 2. Water supply sources: Ground water and surface water, Ground water exploration aquifer properties and ground water flow, Well hydraulics and well design; 3. Common water supply systems with specific reference to Bangladesh, shallow hand tube-wells, deep tube-wells, deep set pumps and alternative water supplies for problem areas.	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A (20 Marks)</b>	
4. Ground water exploration: aquifer properties and ground water flow, well hydraulics, water well design, drilling, construction and maintenance; water demand for rural communities. 5. Surface water collection and transportation; head works; pumps and pumping machineries; water demand for rural communities.	
<b>Group-B (30 Marks)</b>	
6. Water distribution systems; analysis and design of distribution network; fire hydrants; water meters; leak detection; unaccounted for water. 7. Water quality and treatment: water quality parameters and standards, water treatment: plain sedimentation, flocculation and settlement, filtration, disinfection. 8. Miscellaneous treatment methods: small scale iron and arsenic removal units, other low-cost treatment methods for rural communities, water safety plans.	
Recommended Books	1. Harmancioglu, N, Fistikoglu, O., & Singh, V.P. (2010). <i>Water Quality Monitoring Network Design</i> . Springer. 2. Willis, R., & Finney, B.A. (2003). <i>Environmental Systems Engineering an Economic</i> . Springer. 3. Hipel, K.W., & Mcleod, I. (2010). <i>Stochastic and Statistical Methods in Hydrology and Environmental Engineering</i> . Springer. 4. Panu, U.S., Singh, V.P., Harmancioglu, N., Singh, V.P., Alpaslan, M.N. <i>Environmental Data Management</i> . 5. Surhone, L.M., Timpledon, M.T., Marseken, S. F. <i>Environmental Engineering</i> . 6. Peavy, H.S., Rowe, D.R., & Tchobanoglous, G. (1984). <i>Environmental Engineering</i> . McGraw-Hill. 7. Nemerow, N.L., Agardy, F.J., Joseph A. , & Schulze, S.P. (1998). <i>Engineering within Ecological Constraints</i> . National Academy Press 8. Henry, J.G., & Heinke, G.W. (1996). <i>Environmental Science and Engineering</i> . Prentice Hall,



<b>Course Code: CE-3609</b> <b>Credit Hours; 3</b>	<b>Course Title: Transportation Engineering-II: (Pavement Design and Railway Engineering) Contact hours: 3 Hrs per Week</b>
<b>Section-A</b> <b>(Mid-term Exam: 30 Marks)</b>	
1. Pavement materials: bituminous binders, cement, 2. Aggregates and Embankment material ; 3. Soil stabilization	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A (20 Marks)</b>	
4. Road constructions; low-cost roads; 5. Road Production and road maintenance; Highway intersection design.	
<b>Group-B (30 Marks)</b>	
6. Mix design methods : Design, construction and maintenance of flexible and rigid road pavements; 7. Pavement components and functions, pavement design and construction, 8. Railway engineering: general requirements, rolling stock and tracks, stations and yards, points and crossings, signaling, maintenance operation	
Recommended Books	1. James T. Ball. (2001). <i>Transportation Engineering</i> . McGraw-Hill. 2. Papacostas, C.S., & Prevedouros, P.D. (2007). <i>Transportation Engineering and Planning</i> . Prentice Hall of India. 3. Khisty, C.J., & Lall, B. K. (2002). <i>Transportation Engineering and Introduction</i> . Prentice Hall. 4. Murthy, N.A.S, & Mohle, R.(2000) <i>Transportation Engineering Basics</i> . ASCE. 5. Banks, J.B. (2001). <i>Introduction to Transportation Engineering</i> . McGraw-Hill. 6. Kutz, M. (2011). <i>Handbook of Transportation Engineering</i> . McGraw-Hill. 7. Pagnette, R.J., & Wright, P.H. (1982). <i>Transportation Engineering planning and Design</i> . John Wiley & Sons Inc. 8. Qiu, Y., Luo, X., Wang, K.C.P., & Shuai, B. (2009). <i>International Conference on Transportation Engineering</i> . ASCE. 9. Macpherson, M. (1993). <i>Highway and Transportation Engineering and planning</i> . John Wiley. 10. Hoel, L.A., & Garber, N. (2007). <i>Transportation Infrastructure Engineering: A Multimodal Integration</i> , Engage Learning. 11. Bazzan, A., & Klugl, F. (2009). <i>Multi-agent Systems for Traffic and Transportation Engineering</i> Information Science Reference. 12. Cascetta, E. (2001). <i>Transportation systems Engineering; Theory and Methods</i> . Kluwer Academic.



<b>Course Code: MGT-3601</b>		<b>Course Title: Industrial Management</b>	
<b>Credit hour: 2</b>		<b>Contact hours: 2 Hrs Per week</b>	
<b>Objectives</b>	In this course student learn about 'Industrial Management' in regards to the importance of management, manpower planning and development, cost & financial management, marketing and production management, industrial law and professional practice.		
<b>Section –A</b> <b>(Mid-term Exam: 30 Marks)</b>			
<b>1. Preliminaries</b>	Definition, Importance of management, Evolution, Functions of management, Introduction to Industry & organizational management.		
<b>2. Organization and it's Environment:</b>	Environmental context of the Organization.		
<b>3. Organizing &amp; stuffing:</b>	Theory & structure, Co-ordination, Span of control, Authority delegation, Formal & Informal Groups, Committee and task force, Manpower planning & Development.		
<b>Section- B (Final Exam: 50 Marks)</b> <b>Group- A (20-Marks)</b>			
<b>4. Cost &amp; Financial Management:</b>	Investment analysis, benefit-cost analysis & it's implications in decision making. Cost planning & Price Control, budget & budgetary control, development planning process.		
<b>5. Marketing Management:</b>	Concepts, strategy, sales promotion, Transportation & Storage. Technology management: Management of innovation & changes, technology lifecycle		
<b>Group-B (30 Marks)</b>			
<b>9. Production Management:</b>	Designing operations system in production and service-oriented industry. Product layout, process layout, & fixed position layout. Organizational technologies: automation, computer-assisted manufacturing, flexible manufacturing system, and robotics. TQM, bench marking, ISO 9000, SQC.		
<b>10. Industrial Law:</b>	Law of contract, sale of goods, Hire and purchase, Negotiable instrument Act, patent right and validity. Factories act, Industrial relations ordinance, workmen's compensation act.		
<b>11. Professional Practice:</b>	Tender documentation, General conditions of tender, Tech. Specification, Purchase & procurement rules-2004, Technical evaluation, Copyright, Intellectual property right.		
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1) Griffin, R. W. (2012). <i>Management</i>. Cengage Learning.</li> <li>2) Wehrich, H. &amp; Koontz, H. (2004) <i>Management A Global Perspective</i>. McGraw-Hill.</li> <li>3) Terry &amp; Frankin. <i>Principle of Management</i>.</li> <li>4) Flippo, E.B. (1984). <i>Personnel Management</i>. McGraw-Hill.</li> <li>5) Monappa, A. (2012). <i>Industrial Relations</i>. Tata McGraw Hill.</li> <li>6) Jabnoun, N. (2008). <i>Islam &amp; Management</i>. International Islamic Publishing House.</li> <li>7) Faridi, F.R. <i>Islamic Principles of Business. Organization and Management</i>.</li> <li>8) Schiffman, L. G., &amp; Kanuk, L. L. (2009). <i>Consumer Behavior</i>. Prentice Hall.</li> <li>9) Stevenson, W.J. <i>Management Science</i>.</li> <li>10) Koontz, H. (2004). <i>Management</i>. McGraw-Hill.</li> </ol>		



**SESSIONAL**

<b>Course Code: CE-3604</b> <b>Credit Hours:1.5</b>	<b>Course Title: Concrete Structure Design II Sessional</b> <b>Contact hours: 3 Hrs per Week</b>
<b>Course Content</b>	Analysis and design problems based on CE 3417; design of a slab bridge, simple girder bridge and a low-rise building.

<b>Course Code: CE-3608</b> <b>Credit Hours:1.5</b>	<b>Course Title: Environmental Engineering-Sessional</b> <b>Contact hours: 3 Hrs per Week</b>
<b>Course Content</b>	Water and wastewater sampling techniques, sample preservation, physical, chemical and biological tests of water and wastewater; breakpoint chlorination, alum coagulation, sampling and laboratory analysis of air, sampling and laboratory analysis of soil and solid waste, design of water supply system.

<b>Course Code:URIS-3604</b> <b>Credit Hours: 1</b>	<b>Course Title: Life and Teaching of the Prophet Muhammad (SAAS)</b> <b>Contact hours: 2 Hrs per Week,</b>
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<b>Objectives</b>	This course aims to achieve the following objectives: <ul style="list-style-type: none"> <li>➤ To develop a clear understanding of the Prophet’s mission and teaching amongst the students and equipped them with the knowledge about our beloved Prophet (SAAS.).</li> <li>➤ To bring home the understanding to the students that the Prophet (SAAS.) is the last and final Messenger of Allah (SWT) among all the other Prophets of Allah and therefore, Prophet’s teaching is the sole guidance as to be followed by the entire mankind.</li> <li>➤ To activate the students to know the meaning and significance of the Prophethood of the Prophet (SAAS.) so that the learners can better be able to examine their own position in the touchstone of the teachings of the Noble Prophet (SAAS.).</li> </ul>
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**Section-A**  
**(Mid-term Exam:30 Marks)**

<b>Chap-1</b>	An introduction to <i>Siratunnabi</i> (SAAS.): A comprehensive view, <i>Sirah</i> and its literally and technical meaning, Socio-Political, Religious condition of pre-Islamic Arabia: an Overview.
<b>Chap-2</b>	Birth and Childhood of Prophet (SAAS, Business trip with his uncle <i>Abu Talib</i> , Formation of <i>Hilful-Fudul</i> , Contribution of Mohammad (SAAS.) in the business of <i>Khadijah</i> , Rebuilding of <i>Al-Ka’bah</i> and receiving the truth.
<b>Chap-3</b>	Beginning of Islamic Movement at <i>Makkah</i> : Prophethood, First revelation and its impact. Propagation of Islam Begins in secret, The Prophet on the Mount of <i>Safa</i> . Oppositions from the <i>Quraysh</i> Begin

**Section 0B: (Final Examination: 50 Marks)**

<b>Chap-4</b>	Prophet (SAAS.) at <i>Makkah</i> : Boycott and Confinement of the Prophet (SAAS.) and
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	Banu Hashim by the Quraish, The Year of sorrow.
<b>Chap-5</b>	<i>Taif</i> - the most difficult day, <i>Mi'raj</i> of the Prophet. Covenants of <i>Al-Aqabah</i> . <i>Hijrah</i> of the Prophet (SAAS.).
<b>Chap-6</b>	The Prophet (SAAS.) at <i>Madinah</i> : Construction of the Mosque, The Charter of <i>Madinah</i> , Important Battles till the agreement of <i>Hudaybiyah</i> - The Battles of <i>Badr</i> , <i>Uhud</i> and <i>Ahzab</i> , <i>Hudaybiyah</i> Agreement.
<b>Chap-7</b>	Letters of the Prophet (SAAS.) to the kings beyond Arabia, Battle of <i>Muta</i> , Battle of <i>Hunayun</i> , The conquest of <i>Makkah</i> .
<b>Chap-8</b>	The Farewell Address of the Prophet (SAAS.) and its lessons, Contributions of the Prophet (SAAS.) as a reformer and as a nation builder and as an Idle for the all.
<b>Recommended Books</b>	<ol style="list-style-type: none"><li>1. Nadwi, S.S. <i>Muhammad The Ideal Prophet: A Historical, Practical, Perfect Model for Humanity</i>. Translated by Mohiuddin Ahmad. Islamic Book Trust K.L.N.D.</li><li>2. Abbott, N. (1998). <i>Aishah: The Beloved of Mohammad</i>. London: Al-Saqi.</li><li>3. Andrae, T. (1936). <i>Mohammed: The Man and His Faith</i>. London: George Allen &amp; Unwin.</li></ol>



আন্তর্জাতিক ইসলামী বিশ্ববিদ্যালয় চট্টগ্রাম  
الجامعة الإسلامية العالمية شيتاغونغ  
**International Islamic University Chittagong**  
**Department of Civil of Engineering (CE), FSE**





## THEORY

<b>Course Code: CE-4700</b>		<b>Course Title: Project or Thesis</b>	
<b>Credit Hours:2+2</b>		<b>Contacts Hours: 3 Hours per Week</b>	
<b>Course Content</b>	Each students will be required to undertake a Project/Thesis which is a academic value <b>for a period of 2 semesters (semester 7 and semester 8)</b>  The Project/Thesis involves experimental and theoretical investigation of various topics in Structural Engineering, Concrete Technology, Environmental Engineering, Transportation Engineering, Water Resources Engineering and Geotechnical Engineering, Individual of group study of one or more topic from any one the above fields. The student is expected to design a possible solution to the problem, taking into account various aspects such as professionalism, economy, costing and engineering viability.  At the end of the project/thesis (i.e. in the 8 <sup>th</sup> semester) it is expected that the student will submit a proper written report and will present his/her work before the <b>Examination Board</b> for defense..  The Grade will be calculated in the CGPA of the 8 <sup>th</sup> semester of the Final Year.		
<b>Laboratory</b>	Access to the Sessional facilities shall be provided according to the needs and suitable of the projects.		
<b>Reference</b>	Reference materials relevant to the individual project to be provided by the thesis/project supervisor.		

<b>Course Code: CE-4707</b>	<b>Course Title: Environmental Engineering-II (Waste water, Sanitation and sewerage) Contact hours: 3 Hrs per Week,</b>		
<b>Credit Hours: 3</b>			
<b>Section-A</b> <b>(Mid-term Exam:30 Marks)</b>			
1. Waste water Engineering; introduction; water supply, sanitation and health; estimation of waste water; waste water collection systems; hydraulics of sewer. 2. Design, construction and maintenance of sanitary sewer and storm drainage system; sewer appurtenances, plumbing system. 3. Microbiology of sewerage and waste, wastewater characteristics, preparatory.			
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A(20 Marks)</b>			
4. Primary and secondary treatment methods and disposal; treatment and disposal of industrial effluents; sludge treatment and disposal; 5. 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;			
<b>Group-B(30 Marks)</b>			



6. Rural sanitation in Bangladesh. Socio-economic aspects of WSS: Socio-economy of rural and urban Bangladesh, demographic characteristic, power structure, cultural issues (traits), rural leadership; local government structure. 7. Influence of socio-economic aspects on community water supply and sanitation; concept of community participation, participatory planning, conceptual frame, women empowerment, gender auditing, gender balance and sensitivity. 8. Health and Hygiene: Disease description, transmission and control, hygiene education; scope and methodology, social mobilization for hygiene practice; integrated approach for water, sanitation and health education.	
Recommended Books	1. Schanze, J., Zeman, E., & Marsalek, J. (2006). <i>Flood Risk</i> . Springer. 2. Knight, D.W., & Shamseldin, Y.A. (2005). <i>River Basin Modeling for Flood Risk Mitigation</i> . CRC Press. 3. Kumar, A. (2009). <i>Handbook of Flood Management</i> . SBS Publishers. 4. Fleming, G. (2002). <i>Flood Risk Management</i> . Thomas Telford Publishing. 5. Chin, O.P. (2009). <i>Flood Risk Management</i> . Nova Science Publishers. 6. Brebbia, C.A., Popov, V., & Beriatos, E. (2008). <i>Risk Analysis: Simulation and Hazard Mitigation</i> . WIT Press.

<b>Course Code: CE-4709</b>	<b>Course Title: Hydrology, Irrigation and Flood Management</b>
<b>Credit Hours: 3</b>	<b>Contact hours: 3 Hrs per Week,</b>
<b>Section-A</b> <b>(Mid-term Exam:30 Marks)</b>	
1. Introduction: Concepts of hydrology, hydrologic cycle, Meteorological aspects of Hydrology, 2. Weather and Hydrology, Precipitation, water losses, interception, evaporation, transpiration & infiltration, 3. Run off: Factors affecting run off, estimation of runoff, rainfall-runoff relationship.	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A (20 Marks)</b>	
4. Stream flow: Stream flow and stream gaging, Hydrographs, Unit hydrographs, 5. Hydrographs of overland flow, Hydrologic routing, Statistical methods in hydrology.	
<b>Group-B (30 Marks)</b>	
6. Ground water: Introduction, aquifer properties and ground water flow, well hydraulics, and quality of ground water. Ground water recharge, design, drilling and construction of water wells. 7. Consumptive use and estimation of irrigation water requirements; methods of irrigation; quality of irrigation water; problems of irrigated land; 8. Flood and its management.	
Recommended Books	1. International Atomic Energy Agency. Isotope Hydrology Section. (2007). <i>Atlas of Isotope Hydrology – Africa</i> . Intl Atomic Energy Agency. 2. Yaji, M., & Daura, M.M. (2010). <i>Basic Hydrology</i> . LAP LAMBERT Academic Publishing. 3. Ojha, Bhunya, & Berndtsson. (2008). <i>Engineering Hydrology</i> . Oxford University Press.



	<ol style="list-style-type: none"> <li>4. Chow, V.T., Maidment, D.R., &amp; Mays, L.W. (1988). <i>Applied Hydrology</i>. McGraw-Hill.</li> <li>5. Wilson, E.M. (1990). <i>Engineering Hydrology</i>. Palgrave Macmillan.</li> <li>6. Singh, V.P. (1997). <i>Environmental Hydrology</i>. Wiley-Inter Science.</li> <li>7. Sen, Z. (2008). <i>Wade Hydrology</i>. CRC Press.</li> <li>8. Jones, J.A.J. (1997). <i>Global Hydrology</i> Rutledge.</li> <li>9. Chang, M. (2012). <i>Forest Hydrology</i>. CRC Press.</li> <li>10. Ward, A. (2003). <i>Environmental Hydrology</i>. CRC Press.</li> <li>11. Todd, D. K., &amp; Mays, L.W. (2004). <i>Groundwater Hydrology</i>. Wiley.</li> <li>12. Bedient, P., Huber, W.C., &amp; Vieux, B.E. (2012). <i>Hydrology and Floodplain Analysis</i>. Prentice Hall.</li> <li>13. Shaw, E.M. (1983). <i>Hydrology in Practice</i>. Van Nostrand Reinhold.</li> <li>14. Wilson, W.E., &amp; Moore, J.E. (1998). <i>Glossary of Hydrology</i>. American Geological Inst</li> </ol>
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**CE-48XX- Theory from Major option**  
**CE-48XX-Major Corresponding Lab.**  
**CE-48XX Theory from Minor option**

<b>Course Code: CE-4725</b>		<b>Course Title: Professional Ethics and Environmental Protection Law Contact hours: 3 Hrs per Week</b>	
<b>Credit Hours: 3</b>			
<b>Objectives</b>	In this course student learn about “Professional Ethics and Environmental Protection” in regards to history and development of engineering ethics, ethical expectations, cyber law and laws regarding environmental Protection..		
<b>Section-A (Mid-term Exam:30 Marks)</b>			
<ol style="list-style-type: none"> <li>1. History and Development of Engineering Ethics: Study of Ethics in Engineering. Applied Ethics in engineering. Human qualities of an engineer.</li> <li>2. Obligation of an engineer to the clients and to other engineers. Measures to be taken in order to improve the quality of engineering profession.</li> <li>3. Ethical Expectations: Employers and Employees inter-professional relationship, maintaining a commitment of Ethical standards. Desired characteristics of a professional code. Institutionalization of Ethical conduct.</li> </ol>			
<b>Section-B (Final Exam: 50 Marks) Group-A (20-Marks)</b>			
<ol style="list-style-type: none"> <li>4. Cyber Law Introduction: The need for Cyber Law, Regulation of Technology and Internet , The Internet and the Problems of Geography and Sovereignty , Freedom of Expression on the Internet, Regulation of Cyber Crime. Offences and Punishment of Technology Crimes.</li> <li>5. The Relationship between Legal and Technological Regulation ,Electronic and Digital Signature. Embedding Law into Technology. Electronic Contract.</li> </ol>			
<b>Group-B (30-Marks)</b>			
12. Environmental policies and legislation; environment protection and management.			
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. Sen, A.K. <i>Hand Book of Commercial Law</i>.</li> <li>2. Khan, A.A. (2003). <i>Labour and Industrial Law</i>. Khoshroz Kitab Mahal.</li> <li>3. Mabbboth, J.D. (1966). <i>An Introduction to Ethics</i> Hutchinson &amp; Co.</li> <li>4. Dogan, S .L. <i>Copyright in Cyberspace: An Introduction</i>.</li> </ol>		



	<p>5. Siddique, A.B. <i>The Law of Contract</i>.</p> <p>6. Durkheim, E.(1992). <i>Professional Ethics and Civics Morals</i>. Routledge.</p> <p>7. Zittrain, J.L.(2005). <i>Internet Law: Technological Complements to Copyright</i>. Foundation Press.</p> <p>8. Narayanan, P.(2008). <i>Intellectual Property Law</i>. Eastern Law House.</p> <p>9. R. Khan,A.R. <i>Business Ethics</i></p>
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<b>Course Code: URRC – 4701</b>		<b>Course Title: A survey of Islamic History and Culture</b>	
<b>Credit Hours: 1</b>		<b>Contact hours: 2 Hrs per Week</b>	
<b>Objectives</b>	<p>1. To create awareness among the students about the history of <i>Khilafah</i> and its glorious contribution towards the development of administration, society, advancement of civilization and education.</p> <p>2. This course also aims at making the students acquainted with the glorious contribution of the Pious Caliphs and their successors towards the development of just administration, advancement of civilization and education and their great services towards humanity at large.</p> <p>3. To make the students conscious about the Muslim contribution towards different fields of world civilization in the medieval age</p>		
<b>Section 01: (Mid-Term Examination: 30 Marks)</b>			
<p><b>Chapter-1: <i>Khilafah</i>:</b></p> <p><b>Chapter-2: Introduction to the Pious <i>Khalifah</i>:</b></p> <p><b>Chapter-3. Administration under the Pious Caliphs</b></p>			
<b>Section 02: (Final Examination: 50 Marks)</b>			
<p><b>Chapter-4: The Umayyad <i>Khilafah</i> (661 A.D-750 A.D):</b></p> <p><b>Chapter-5: Central and Provincial Administration, Social Condition. Umayyah's contribution towards the development of civilization &amp; education, Fall of the Umayyahs. An overall portrayal of Umayyad <i>Khilafah</i>.</b></p> <p><b>Chapter-6: The Abbasid <i>Khilafah</i> (750 A.D-1258 A.D):</b></p> <p><b>Chapter-7: The Umayyad <i>Khilafah</i> of Spain and The Fatimid <i>Khilafah</i> of Egypt.</b> A brief analysis.</p> <p><b>Chapter-8 :Muslim contribution to the different fields of world civilization</b></p>			
<b>Recommended Books</b>	<p>1. Hitti, P.K. (1970). <i>History of the Arabs</i>, Macmillan edition. London.</p> <p>2. Hussaini, S.A.Q. (1936). <i>The Arab Administration</i>, Lahore.</p> <p>3. Ali, S. A. (1916). <i>A Short History of Saracens</i>, Macmillan edition, London.</p> <p>4. Lewis, B., &amp; Holt, P.M. (1947). <i>Cambridge History of Islam</i>.</p>		

**CE-48XX- Theory from Major option**  
**CE-48XX-Major Corresponding Lab.**  
**CE-48XX Theory from Minor option**



আন্তর্জাতিক ইসলামী বিশ্ববিদ্যালয় চট্টগ্রাম  
الجامعة الإسلامية العالمية شيتاغونغ  
**International Islamic University Chittagong**  
**Department of Civil of Engineering (CE), FSE**

## **SESSIONAL**

<b>Course Code: CE-4708</b> <b>Credit Hours: 1.5</b>		<b>Course Title: Design of Water Supply, Sanitation and Sewerage System Sessional</b> <b>Contact hours: 3 Hrs per Week,</b>
<b>Course Content</b>	Design of water supply and sewerage system: estimation of industrial, domestic and fire demands, designing deep tubewell and water distribution network; estimation of industrial, domestic and commercial wastewater generation, wastewater network design; household plumbing system design; design of water and wastewater treatment plant; computer application in environmental engineering; field visits and reporting.	



আন্তর্জাতিক ইসলামী বিশ্ববিদ্যালয় চট্টগ্রাম  
الجامعة الإسلامية العالمية شيتاغونغ  
**International Islamic University Chittagong**  
**Department of Civil of Engineering (CE), FSE**





## THEORY

CE-48XX- Theory from another Minor option

CE-48XX-Minor Corresponding Lab.

CE-48XX Theory from Major option

<b>Course Code: CE-4801</b> <b>Credit Hours: 1</b>	<b>Course Title: Research Methodology</b> <b>Contact hours: 1 Hr per Week</b>
<b>Objective</b>	The aim of the course is to teach students the systematic approach to doing any research and how to present the results obtained from it in a convincing way.
<b>Section-A</b> <b>(Mid-term Exam: 30 Marks)</b>	
1) Introduction: Research motivation, research objective, contribution, methodology and research outlines 2) Literature Reviews: Element of research, reviewing of related works, choosing of methodology, comparative method, proposed method. 3) Design of Research Methodology: Designing of proposed method.	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A (20 Marks)</b>	
4) Concept of Measurement: Data Collection, data analyzing, compression and discussion 5) Discussion	
<b>Group-B (30 Marks)</b>	
6) Conclusion 7) Scientific Paper Writing: Abstract, introduction, materials and methods, results, discussion, table, figures, citations, references, format, conference paper, journal paper 8) Seminar and presentation.	
<b>Recommended Books</b>	1. Kothari, C.K. (1985). <i>Research Methodology, Methods and Techniques</i> . Vishwa Prakashana, New Delhi. 2. Zar, J.H. <i>Bio-statistical Analysis</i> . Pearson education



<b>Course Code: CE-4803</b> <b>Credit Hours: 2</b>	<b>Course Title: Project Planning and Constructional Management</b> <b>Contact hours: 2 Hrs per Week</b>
<b>Section-A</b> <b>(Mid-term Exam: 30 Marks)</b>	
<ol style="list-style-type: none"><li>1. Project planning and evaluation; feasibility reports; cash flows, pay back period, internal rate of return.</li><li>2. A cost accounting system, benefit-cost ratio; cost-benefit analysis case studies. Replacement studies</li><li>3. Planning and scheduling, PERT, CPM; resource scheduling; linear programming and application.</li></ol>	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A(20 Marks)</b>	
<ol style="list-style-type: none"><li>4. Principles of management; construction and management of plant: principles, project organization, methods and practices, technology and economy.</li><li>5. Management of materials and equipments, stores management; procurement. site management, contracts and specifications, inspection and quality control.</li></ol>	
<b>Group-B(30 Marks)</b>	
<ol style="list-style-type: none"><li>6. Conflict management; psychology in administration: human factors in management; human resource management.</li><li>7. Demand forecasting; inventory control; stores management and procurement;</li><li>8. Legal issues in construction; environmental regulations, safety.</li></ol>	
Recommended Books	<ol style="list-style-type: none"><li>1) Griffin, R.W. (2012). Management. Engage Learning.</li><li>2) Wehrich, H. &amp; Koontz, H. (2004).Management A Global Perspective. McGraw-Hill.</li><li>3) Stevenson, W.J. (2011). Management Science. McGraw-Hill.</li><li>4) Terry &amp; Frankin. (1982). Principles of Management. Irwin Professional Pub.</li><li>5) Flippo, E.B. (1984). Personnel Management. McGraw-Hill.</li><li>6) Monappa, A. Islam and Management.</li><li>7) Faridi, F.R. Islamic Principles of Business Organization</li></ol>



<b>Course Code: CE-4805</b> <b>Credit Hours: 2</b>	<b>Course Title: Professional Practices and Communication</b> <b>Contact hours: 2 Hrs per Week</b>
<b>Section-A</b> <b>(Mid-term Exam: 30 Marks)</b>	
<ol style="list-style-type: none"> <li>1. Project, its characteristic feature, project life cycle; type of contracts;</li> <li>2. Procurement regulations and law; documents for procurement of works, goods and services and their application;</li> <li>3. Contract risk and contract responsibility; insurances</li> </ol>	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A(20 Marks)</b>	
<ol style="list-style-type: none"> <li>4. Tender procedure; claims, disputes and arbitration procedure; measures for reducing fiduciary risks.</li> <li>5. Introduction to communication concepts, modes of communication, methods of effective communication; writing reports;</li> </ol>	
<b>Group-B(30 Marks)</b>	
<ol style="list-style-type: none"> <li>6. Oral presentation of reports; writing proposals; preparing effective business messages;</li> <li>7. Conducting meetings; strategies for effective speaking and successful inter personal communication;</li> <li>8. Job application process, interviews and follow-ups; an introduction to the code of ethics for engineers.</li> </ol>	
Recommended Books	?

<b>Course Code: CE-4807</b> <b>Credit Hours: 3</b>	<b>Course Title: Design of Steel Structure</b> <b>Contact hours: 3 Hrs per Week,</b>
<b>Section-A</b> <b>(Mid-term Exam: 30 Marks)</b>	
Behavior of structural steel members and steel frames. Code requirements.	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A (20 Marks)</b>	
Design of tension and compression members by WSD and LFD methods.	
<b>Group-B (30 Marks)</b>	
Design of beam, beam-columns; Joints design. Design of members and connections of steel structures: plate girders.	
<b>Recommended Books:</b>	<ol style="list-style-type: none"> <li>1. Buckner, C.D., &amp; Shahrooz, B.M. (1997). <i>Composite Construction in steel and concrete III</i>. American Society of Civil Engineers.</li> <li>2. Izor, E.P. (2012). <i>Costume Design and Home Planning</i>. Ulan Press.</li> <li>3. Gupta, R.K., Guernic, P.L., Shukla, S.K., &amp; Talpin, J.P. (2012). <i>Formal Methods and Models for System Design</i>. Springer.</li> <li>4. Bangash, M.Y.H., &amp; Bangash, T.(2003). <i>Elements of Spatial Structures: Analysis and Design</i>. Thomas Telford Publishing.</li> <li>5. Veeks, H.P., Ottjes, J.A., &amp; Laodewijks, G.(2008). <i>The Delft Systems Approach: Analysis and Design of Industrial Systems</i>. Springer.</li> <li>6. Bechthold, M.(2008). <i>Innovative Surface Structures: Technologies and Applications</i>. Taylor &amp; Francis.</li> </ol>



## SESSIONAL

<b>Course Code: CE-4806</b>		<b>Course Title: Professional Practices and communication</b>	
<b>Credit Hours: 1.5</b>		<b>Sessional, Contact hours: 3Hr per week</b>	
<b>Course Content</b>	Application of communication theory and professional practice approaches in a controlled class room environment; this may include case study analysis, role playing, preparing small reports and proposals, class room presentations and individual reports etc.		

<b>Course Code: CE-4808</b>		<b>Course Title: Steel Structures Design Sessional</b>	
<b>Credit Hours: 1.5</b>		<b>Contact hours: 3Hr per week</b>	
<b>Course Content</b>	Computer based analysis of steel structures e.g. roof truss and bridge truss; design of members and joints of roof and bridge truss.		

<b>Course Code: CE-4810</b>		<b>Course Title: General Viva Voce</b>	
<b>Credit Hours: 1</b>		<b>Contact hours: 1 Hr per week</b>	

<b>Course Code: URBS -4802</b>		<b>Course Title: History of Bangladesh Independence</b>	
<b>Credit Hours: 2</b>		<b>Contact hours: 2Hrs per Week</b>	
<b>Objectives</b>	The objective of this course is to study the dynamic and diverse movements of the people of Bangladesh to achieve its independence in 1971. The course will focus primarily on the rising of Bengali nationalism and the national identity crisis of the Bengali along with significant autonomous vibrations regarding changes in the politics of social dominance in the period –from appearance of united Pakistan to the Bangabondhu regime of Bangladesh.		
<b>Learning Outcomes</b>	The learners will be able to realize and appreciate the background and glory of the War of Independence of Bangladesh. They will evaluate the roles of Bangabondhu as the founder and un-parallel leader of Bangladesh. This course will also help them uphold the sentiments of liberation war resulting in the enhancement of patriotism that will encourage the learners to contribute to building a non-communal, democratic and developed Bangladesh in the context of modern world.		
<b>Section-A</b> <b>(Mid-term Exam: 30 Marks)</b>			
Chap-1	<b>Language Movement and quest for Bengali identity:</b> The Language Movement: context and phases, United front of Haque –Vasani – Suhrawardi: election of 1954, consequences, Misrule by Muslim League and Struggle for democratic politics.		
Chap-2	<b>Military regimes of Ayub Khan and Yahya Khan (1958-1971):</b> Ayub Khan's rise to power, Political repression and Basic democracy, Fall of Ayub Khan and Yahya		



	Khan's rule .
Chap-3	<b>Rise of nationalism and the Movement for self-determination:</b> Resistance against cultural aggression and resurgence of Bengali culture, Sheikh Mujibur Rahman and the six point movement, The Agortola Case 1968.
<b>Section-B</b> <b>(Final Exam: 50 Marks)</b>	
Chap-4	<b>Election of 1970 :</b> Election result and centres refusal to comply, The non-cooperation movement,
Chap-5	<b>The Declaration of Independence &amp; The war of Liberation 1971:</b> The 7th March, Address, Operation Searchlight, Declaration of Independence by Bangobondhu and his arrest. Genocide and repression of people, Formation of Bangladesh government and proclamation of Independence, MuktiFouz, MuktiBahini, guerillas and the frontal warfare.
Chap-6	<b>Publicity Campaign in the war of Liberation:</b> Shadhin Bangla Betar Kendra, the Campaigns abroad and formation of public opinion, Contribution of students, women and the masses, The role of super powers and the Muslim states in the Liberation war,
Chap-7	<b>Victory:</b> The Anti-liberation activities of the occupation army and its Collaborators, killing of the intellectuals, Trial of Bangabondhu and reaction of the World Community, The role of India in the Liberation War, Formation of joint command and the Victory.
Chap-8	<b>The Bangabondhu Regime 1972-1975:</b> Homecoming of Bangabondhu, Making of the constitution, Reconstruction of the war ravaged country, The murder of Bangabondhu and his family and the ideological turn-around.
Recommended Books	<ol style="list-style-type: none"><li>1) Abul Mansur Ahmad, <i>Amar DekhaRajniteerPoncashBochor</i>, SrijonProkashoni Ltd. Dhaka, 1988.</li><li>2) AbulMaal A. Muhit, <i>State Language Movement in East Bengal 1947-1956</i>, The University Press Limited, Dhaka, 2008.</li><li>3) AbulMaal A. Muhit, <i>Bangladesh: Emergence of a Nation</i>, Bangladesh Books International Limited, Dhaka, 1978.</li><li>4) AbulAsad, <i>EkshobochorerItihas</i>, Bangladesh Co-operative Book Society, Dhaka, 1997.</li><li>5) Akbar Ali Khan, <i>Discovery of Bangladesh</i>, The University Press Ltd., 2009.</li><li>6) AK Khandker, <i>1971 VitoreBaire</i>, ProthomaProkashon, 2015.</li><li>7) A.F. Salahuddin Ahmed, <i>Bengali Nationalism and Emergence of Bangladesh</i>,The University Press Ltd., Dhaka, 1994.</li></ol>



### OPTION-I (Structural Engineering)

<b>Course Code: CE-4811</b>	<b>Course Title: Introduction to Finite Element Method</b>
<b>Credit Hours: 2</b>	<b>Contact hours: 2 Hrs per week</b>
<b>Section-A</b>	
<b>(Mid-term Exam: 30 Marks)</b>	
Introduction to finite element method as applied to Civil Engineering problems,	
<b>Section-B (Final Exam: 50 Marks)</b>	
<b>Group-A(20 Marks)</b>	
One dimensional stress deformation and time depended flow problems,	
<b>Group-B (30 Marks)</b>	
Two dimensional plane stress and plane strain, analysis of stress deformation problems.	
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. Kotsovos, M.D., &amp; Pavlovic, M.N.(1995). Structural Concrete, Finite-element Analysis for limit state design. Thomas Telford Publishing.</li> <li>2. Woodford, C.H., Passaris, E.K.S., &amp; Bull, J.B.(1998). Engineering Analysis Using PAFEC Finite Element Software. CRC Press.</li> </ol>

<b>Course Code: CE-4813</b>	<b>Course Title: Structural Analysis Design III</b>
<b>Credit Hours: 2</b>	<b>Contact hours: 2 Hrs per week</b>
<b>Section-A</b>	
<b>(Mid-term Exam: 30 Marks)</b>	
<ol style="list-style-type: none"> <li>1. Analysis of statically indeterminate structures by displacement method,</li> <li>2. Column analogy method, slope deflection method.</li> <li>3. Moment distribution.</li> </ol>	
<b>Section-B (Final Exam: 50 Marks)</b>	
<b>Group-A(20 Marks)</b>	
<ol style="list-style-type: none"> <li>4. Stiffness matrix, member stiffness, stiffness transformation,</li> <li>5. Assembly of stiffness matrices &amp; solution for beams,</li> <li>6. Frames and plane trusses and flexibility matrix.</li> </ol>	
<b>Group-B (30 Marks)</b>	
<ol style="list-style-type: none"> <li>7. Analysis of composite structures</li> <li>8. Influence line for statically indeterminate beams, frames, arches and girders;</li> <li>9. Structural frames and their application (e.g shear wall, frame, Tube-in tube etc).</li> </ol>	
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1) Ling , H.I., Leshchinsky, D., &amp; Tatsuoka,F.(203). Reinforced Soil Engineering – Advances in Research and Practice.CRC Press.</li> <li>2) Foster, M.S.(2007). Materials of Industry - Their Distribution and Production, Brunauer Press..</li> <li>3) Sullivan, K. Structural Engineering Compendium.</li> <li>4) Westinghouse, G.(2007). Science and Civilization – Vol I. Mason Press.</li> <li>5) Kotsovos, M.D., &amp; Pavlovic ,M.N.(1998). Structural Concrete: Finite-Element Analysis for Limit – State Design. Thomas Telford Ltd ,.</li> </ol>



<b>Course Code: CE-4815</b> <b>Credit Hours: 2</b>	<b>Course Title: Pre stressed Concrete</b> <b>Contact hours: 2 Hrs per week</b>
<b>Section-A</b> <b>(Mid-term Exam: 30 Marks)</b>	
Pre stressed Concretes: material; pre stressing systems, loss of pre stress, partial pre stress	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A(20 Marks)</b>	
Analysis of sections for flexure, shear, bond and bearing; Beam deflections and cable layout; partial prestress	
<b>Group-B (30 Marks)</b>	
<b>Recommended Books</b>	<ol style="list-style-type: none"><li>1) Raju, N.K. (2010). <i>Prestressed Concrete</i>. CBS Publisher &amp; Distributors Ltd.</li><li>2) Rajagoplan, N. (2003). <i>Prestressed Concrete</i>. Narosa.</li><li>3) Nawy, E.G. (2009). <i>Prestressed Concrete</i>. Prentice Hall.</li><li>4) Surhone, L.M., Mariam T. Tennoe, M.T., &amp; Henssonow, S.F. <i>Prestressed Concrete</i>.</li><li>5) Abeles, P.W., &amp; Bradman-Roy, B.K. (1998). <i>Prestressed Concrete Designer's Handbook</i>. CRC Press.</li><li>6) Hurst, M.K. (2005). <i>Prestressed Concrete design</i>. Taylor &amp; Francis.</li><li>7) Nilson, A.H. (2008). <i>Design of Prestressed Concrete</i>. McGraw-Hill.</li></ol>

<b>Course Code: CE-4817</b> <b>Credit Hours: 2</b>	<b>Course Title: Dynamics of Structures</b> <b>Contact hours: 2 Hrs per week</b>
<b>Section-A</b> <b>(Mid-term Exam: 30 Marks)</b>	
Formulation of equation of motion; free vibration response; response to harmonic,	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A(20 Marks)</b>	
SDOF and MDOF system;	
<b>Group-B (30 Marks)</b>	
Impulse and general dynamic loading, vibration analysis by Rayleigh's method.	
<b>Recommended Books</b>	<ol style="list-style-type: none"><li>3. Surhone, L.M., Tennoe, M.T., &amp; Henssonow, F. (1998). <i>Structural Analysis</i>. Wiley-Blackwell.</li><li>4. Ray, S.S. (1998). <i>Structural Steelwork: Analysis and Design</i>. Wiley-Blackwell.</li><li>5. Bangash, M.Y.H., &amp; Staircases, T.B. (1999). <i>Structural Analysis and Design</i>. Taylor &amp; Francis.</li><li>6. Rajan, S. (2000). <i>Introduction to structural analysis and Design</i>. Wiley.</li><li>7. Durka, F., Moran, W., Nageim, H.A., &amp; Williams, D.T. (2011). <i>Structural Mechanics: Loads, Analysis, Design and Materials</i>. Prentice Hall.</li><li>8. Dym, C.L. <i>Structural Modeling and Analysis</i>. Cambridge University Press.</li><li>9. Kotsovos, M.D., &amp; Pavlovic, M.N. (1995). <i>Structural Concrete: Finite element Analysis for Limit-state Design</i>. Thomas Telford Publishing.</li></ol>



আন্তর্জাতিক ইসলামী বিশ্ববিদ্যালয় চট্টগ্রাম  
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## SESSIONAL

<b>Course Code: CE-4814</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Computer Aided Analysis &amp; Design of Structures</b> <b>Sessional Contact hours: 3 Hrs per week</b>
<b>Course Content</b>	Computer aided analysis and design of various reinforced concrete and steel structures, e.g. high-rise building, modular bridge, water tower etc..



## OPTION-II (Geotechnical Engineering)

<b>Course Code: CE-4821</b>		<b>Course Title: Earth Retaining Structures</b>	
<b>Credit Hours: 2</b>		<b>Contact hours: 2 Hrs per week</b>	
<b>Course Content</b>	Various types of foundation and their selecting factors, Design and construction of shallow foundation, footings and rafts, Retaining wall, Sheet piles, Dewatering and Slurry-wall construction. braced excavation, cofferdams, caissons		
<b>Recommended Books</b>	<ol style="list-style-type: none"><li>1) Woodford, C.H., Passaris, E.K.S., &amp; Bull, J.W.(1998). <i>Engineering Analysis Using PAFEC Finite Element Software</i>. CRC Press.</li><li>2) Spigolon, S.J.(2001). <i>Geotechnical Engineering</i>. McGraw-Hill.</li><li>3) Lancellotta, R. (2008). <i>Geotechnical Engineering</i>. CRC Press.</li><li>4) Das, B.M. (2013). <i>Geotechnical Engineering</i>. Engage Learning.</li><li>5) Dirnberger, M.M.(2009). <i>Practical Geotechnical Engineering Design</i>. McGraw-Hill.</li></ol>		

<b>Course Code: CE-4823</b>		<b>Course Title: Elementary Soil Dynamics</b>	
<b>Credit Hours: 2</b>		<b>Contact hours: 2 Hrs per week</b>	
<b>Course Content</b>	Elementary vibrations; dynamic properties of soil; seismic response of soils: site effects, site amplification, liquefaction problems, remedial measures and earthquake hazards.		
<b>Recommended Books</b>	<ol style="list-style-type: none"><li>1) Woodford, C.H., Passaris, E.K.S., &amp; Bull, J.W.(1998). <i>Engineering Analysis Using PAFEC Finite Element Software</i>. CRC Press.</li><li>2) Spigolon, S.J.(2001). <i>Geotechnical Engineering</i>. McGraw-Hill.</li><li>3) Lancellotta, R. (2008). <i>Geotechnical Engineering</i>. CRC Press.</li><li>4) Das, B.M. (2013). <i>Geotechnical Engineering</i>. Engage Learning.</li><li>5) Dirnberger, M.M.(2009). <i>Practical Geotechnical Engineering Design</i>. McGraw-Hill.</li></ol>		

<b>Course Code: CE-4825</b>		<b>Course Title: Soil-water Interaction</b>	
<b>Credit Hours: 2</b>		<b>Contact hours: 2 Hrs per week</b>	
<b>Course Content</b>	Introduction to soil-water interaction problems: permeability, capillarity and soil suction; slopes subjected to water current, wave action etc; theories of filters and revetment design; geotechnical design of landfills.		
<b>Recommended Books</b>	<ol style="list-style-type: none"><li>1) Woodford, C.H., Passaris, E.K.S., &amp; Bull, J.W.(1998). <i>Engineering Analysis Using PAFEC Finite Element Software</i>. CRC Press.</li><li>2) Spigolon, S.J.(2001). <i>Geotechnical Engineering</i>. McGraw-Hill.</li><li>3) Lancellotta, R. (2008). <i>Geotechnical Engineering</i>. CRC Press.</li><li>4) Das, B.M. (2013). <i>Geotechnical Engineering</i>. Engage Learning.</li><li>5) Dirnberger, M.M.(2009). <i>Practical Geotechnical Engineering Design</i>. McGraw-Hill.</li></ol>		



## SESSIONAL

<b>Course Code: CE-4822</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Geotechnical Engineering Design Sessional</b> <b>Contact hours: 3 Hrs per week</b>
<b>Course Content</b>	Computer aided design of foundations: footing, pile and pile cap, pier, raft/mat foundations retaining structures: shore pile, abutment, retaining walls; reinforced soils.

<b>Course Code: CE-4824</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Elementary Soil Dynamics Sessional</b> <b>Contact hours: 3 Hrs per week</b>
<b>Course Content</b>	Computer aided design problems based on CE-4833

<b>Course Code: CE-4826</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Soil-water Interaction Sessional</b> <b>Contact hours: 3 Hrs per week</b>
<b>Course Content</b>	Computer aided design problems based on CE-4835



### OPTION –III (Transportation Engineering)

<b>Course Code: CE-4831</b> <b>Credit Hours: 2</b>	<b>Course Title: Transportation Engineering III: Traffic Engineering and Management, Contact hours: 2 Hrs per week</b>
<b>Course Content</b>	Advanced concepts of traffic management, Management strategies; analysis of traffic flow characteristics; Traffic control devices; Intersection control and design; Grade separation and interchanges; Computer application in traffic system analysis; Introduction to micro simulation and ITS; NMT issues and road safety.
<b>Recommended Books</b>	<ol style="list-style-type: none"><li>1) James T. Ball. (2001). <i>Transportation Engineering</i>. McGraw-Hill.</li><li>2) Papacostas, C.S., &amp; Prevedouros, P.D. (2007). <i>Transportation Engineering and Planning</i>. Prentice Hall of India.</li><li>3) Khisty, C.J., &amp; Lall, B. K. (2002). <i>Transportation Engineering and Introduction</i>. Prentice Hall.</li><li>4) Murthy, N.A.S., &amp; Mohle, R. (2000). <i>Transportation Engineering Basics</i>. American Society of Civil Engineers.</li><li>5) Banks, J.B. (2001). <i>Introduction to Transportation Engineering</i>. McGraw-Hill.</li><li>6) Kutz, M. (2011). <i>Handbook of Transportation Engineering</i>. McGraw-Hill.</li><li>7) Pagnette, R.J., &amp; Wright, P.H. (1982). <i>Transportation Engineering planning and Design</i>. John Wiley &amp; Sons Inc.</li><li>8) Qiu, Y., Luo, X., Wang, K.C.P., &amp; Shuai, B. (2009). <i>International Conference on Transportation Engineering</i>. American Society of Civil Engineers.</li><li>9) Macpherson, G. (1993). <i>Highway and Transportation Engineering and planning</i>. John Wiley.</li><li>10) Hoel, L.A., &amp; Garber, N. (2007). <i>Transportation Infrastructure Engineering: A Multimodal Integration</i>, Engage Learning.</li><li>11) Bazzan, A., &amp; Klugl, F. (2009). <i>Multi-agent Systems for Traffic and Transportation Engineering</i> Information Science Reference.</li><li>12) Cascetta, E. (2001). <i>Transportation systems Engineering; Theory and Methods</i>. Kluwer Academic</li></ol>

<b>Course Code: CE-4833</b> <b>Credit Hours: 2</b>	<b>Course Title: Transportation Engineering- IV Pavement Management, Drainage and Airport, Contact hours: 2 Hrs/ week</b>
<b>Course Content</b>	<ul style="list-style-type: none"><li>• Pavement management systems;</li><li>• evaluation and strengthening of pavements;</li><li>• drainage: highway drainage and drainage structures; airports: 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.</li></ul>



<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1) James T. Ball. (2001). <i>Transportation Engineering</i>. McGraw-Hill.</li> <li>2) Papacostas, C.S., &amp; Prevedouros, P.D. (2007). <i>Transportation Engineering and Planning</i>. Prentice Hall of India.</li> <li>3) Khisty, C.J., &amp; Lall, B. K. (2002). <i>Transportation Engineering and Introduction</i>. Prentice Hall.</li> <li>4) Murthy, N.A.S., &amp; Mohle, R. (2000). <i>Transportation Engineering Basics</i>. American Society of Civil Engineers.</li> <li>5) Banks, J.B. (2001). <i>Introduction to Transportation Engineering</i>. McGraw-Hill.</li> <li>6) Kutz, M. (2011). <i>Handbook of Transportation Engineering</i>. McGraw-Hill.</li> <li>7) Pagnette, R.J., &amp; Wright, P.H. (1982). <i>Transportation Engineering planning and Design</i>. John Wiley &amp; Sons Inc.</li> <li>8) Qiu, Y., Luo, X., Wang, K.C.P., &amp; Shuai, B. (2009). <i>International Conference on Transportation Engineering</i>. American Society of Civil Engineers.</li> <li>9) Macpherson, G. (1993). <i>Highway and Transportation Engineering and planning</i>. John Wiley.</li> <li>10) Hoel, L.A., &amp; Garber, N. (2007). <i>Transportation Infrastructure Engineering: A Multimodal Integration</i>, Engage Learning.</li> <li>11) Bazzan, A., &amp; Klugl, F. (2009). <i>Multi-agent Systems for Traffic and Transportation Engineering</i> Information Science Reference.</li> <li>12) Cascetta, E. (2001). <i>Transportation systems Engineering; Theory and Methods</i>. Kluwer Academic</li> </ol>
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<b>Course Code: CE-4835</b>		<b>Course Title: Transportation Engineering V: Urban Transportation Planning and Management</b>	
<b>Credit Hours: 2</b>		<b>Contact hours: 2Hrs per week</b>	
<b>Course Content</b>	<ul style="list-style-type: none"> <li>• The urban transport problems and trends; road network planning; characteristics and operation of different transit and para transit modes, planning transit network;</li> <li>• estimating system costs and benefits, pricing and financing, evaluation, transit users attitude, policies and strategies for transit development in metropolitan cities; and</li> <li>• freight traffic planning and management; selected transport case studies, congestion management; safety management; environmental issues and sustainable transport.</li> </ul>		
<b>Recommended Books</b>	<ol style="list-style-type: none"> <li>1. James T. Ball. (2001). <i>Transportation Engineering</i>. McGraw-Hill.</li> <li>2. Papacostas, C.S., &amp; Prevedouros, P.D. (2007). <i>Transportation Engineering and Planning</i>. Prentice Hall of India.</li> <li>3. Khisty, C.J., &amp; Lall, B. K. (2002). <i>Transportation Engineering and Introduction</i>. Prentice Hall.</li> <li>4. Murthy, N.A.S., &amp; Mohle, R. (2000). <i>Transportation Engineering Basics</i>. American Society of Civil Engineers.</li> <li>5. Banks, J.B. (2001). <i>Introduction to Transportation Engineering</i>. McGraw-Hill.</li> <li>6. Kutz, M. (2011). <i>Handbook of Transportation Engineering</i>. McGraw-Hill.</li> <li>7. Pagnette, R.J., &amp; Wright, P.H. (1982). <i>Transportation Engineering planning and Design</i>. John Wiley &amp; Sons Inc.</li> <li>8. Qiu, Y., Luo, X., Wang, K.C.P., &amp; Shuai, B. (2009). <i>International Conference on Transportation Engineering</i>. American Society of Civil Engineers.</li> </ol>		



<b>Recommended Books</b>	<ol style="list-style-type: none"><li>9 Macpherson, G. (1993). <i>Highway and Transportation Engineering and planning</i>. John Wiley.</li><li>10. Hoel, L.A., &amp; Garber, N. (2007). <i>Transportation Infrastructure Engineering: A Multimodal Integration</i>, Engage Learning.</li><li>11. Bazzan, A., &amp; Klugl, F. (2009). <i>Multi-agent Systems for Traffic and Transportation Engineering</i> Information Science Reference.</li><li>12. Cascetta, E. (2001). <i>Transportation systems Engineering; Theory and Methods</i>. Kluwer Academic</li></ol>
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## SESSIONAL

<b>Course Code: CE-4832</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Transportation Engineering Sessional II: Pavement Design and Traffic Studies</b> <b>Contact hours: 3 Hrs per week</b>
<b>Course Content</b>	Highway planning Design of rigid and flexible highway and air field pavements; geometric design: Roadway intersections capacity calculations; traffic studies and design.

<b>Course Code: CE-4834</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Transportation Engineering IV Sessional</b> <b>Contact hours: 2 Hrs per week</b>
<b>Course Content</b>	Highways drainage planning and design of airports; airport configuration; geometric design of the landing area; Terminal area; heliports; design of airport pavements; lighting, marking and signing; Airport drainage

<b>Course Code: CE-4836</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Transportation Engineering-V Sessional</b> <b>Contact hours: 2 Hrs per week</b>
<b>Course Content</b>	Evaluation and analysis of transportation projects; Implementation of transportation project



### OPTION-IV (Environmental Engineering)

<b>Course Code: CE-4841</b> <b>Credit Hours: 2</b>	<b>Course Title: Solid and Hazardous Waste Management</b> <b>Contact Hours: 2 Hrs per week</b>
<b>Section-A</b> (Mid-term Exam:30 Marks )	
Solid Waste Management: sources and types of solid wastes; physical and chemical properties of solid wasters;	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A (20 Marks)</b>	
Solid wastes generation; on-site handling storage and processing; collection of solid wastes;	
<b>Group-B (30 Marks)</b>	
Transfer stations and transport; ultimate disposal methods; resources and energy recovery; soil pollution. Industrial solid waste collection and disposal; hazardous waste management.	
<b>Recommended Books:</b>	<ol style="list-style-type: none"><li>1. Harmancioglu, N, Fistikoglu, O., &amp; Singh, V.P. (2010). <i>Water Quality Monitoring Network Design</i>. Springer.</li><li>2. Willis, R., &amp; Finney, B.A. (2003). <i>Environmental Systems Engineering an Economic</i>. Springer.</li><li>3. Hipel, K.W., &amp; Mcleod, I. (2010). <i>Stochastic and Statistical Methods in Hydrology and Environmental Engineering</i>. Springer.</li><li>4. Panu, U.S., Singh, V.P., Harmancioglu, N., Singh, V.P., Alpaslan, M.N. <i>Environmental Data Management</i>.</li><li>5. Surhone, L.M., Timpledon, M.T., Marseken, S. F. <i>Environmental Engineering</i>.</li><li>6. Peavy, H.S., Rowe, D.R., &amp; Tchobanoglous, G. (1984). <i>Environmental Engineering</i>. McGraw-Hill.</li><li>7. Nemerow, N.L., Agardy, F.J., Joseph A. , &amp; Schulze, S.P. (1998). <i>Engineering within Ecological Constraints</i>. National Academy Press</li><li>8. Henry, J.G., &amp; Heinke, G.W. (1996). <i>Environmental Science and Engineering</i>. Prentice Hall,</li></ol>



<b>Course Code: CE-4843</b> <b>Credit Hours: 2</b>	<b>Course Title: Environmental Pollution Management</b> <b>Contact Hours: 2 Hrs per week</b>
<b>Section-A</b> <b>(Mid-term Exam:30 Marks )</b>	
Environment Pollution and Its control: water pollution-sources and types of pollutants; waste assimilation capacity of streams; dissolved oxygen modeling; ecological balance of streams.	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A (20 Marks)</b>	
Industrial pollution; heavy metal contamination; detergent pollution and eutrophication; Ground-water pollution; marine pollution;	
<b>Group-B (30 Marks)</b>	
Pollution control measures-water quality monitoring, management, and Noise Pollution-introduction to air and noise pollution and their effects. Air pollution-sources and types of pollutant; effects of various pollutants on human health. Materials and plants; air pollution meteorology; global warming and greenhouse effects; air pollution monitoring and control measures.	
<b>Recommended Books:</b>	<ol style="list-style-type: none"><li>1) Harmancioglu, N, Fistikoglu, O., &amp; Singh, V.P. (2010). <i>Water Quality Monitoring Network Design</i>. Springer.</li><li>2) Willis, R., &amp; Finney, B.A. (2003). <i>Environmental Systems Engineering an Economic</i>. Springer.</li><li>3) Hipel, K.W., &amp; Mcleod, I. (2010). <i>Stochastic and Statistical Methods in Hydrology and Environmental Engineering</i>. Springer.</li><li>4) Panu, U.S., Singh, V.P., Harmancioglu, N., Singh, V.P., Alpaslan, M.N. <i>Environmental Data Management</i>.</li><li>5) Surhone, L.M., Timpledon, M.T., Marseken, S. F. <i>Environmental Engineering</i>.</li><li>6) Peavy, H.S., Rowe, D.R., &amp; Tchobanoglous, G. (1984). <i>Environmental Engineering</i>.</li><li>7) McGraw-Hill.</li><li>8) Nemerow, N.L., Agardy, F.J., Joseph A. , &amp; Schulze, S.P. (1998). <i>Engineering within Ecological Constraints</i>. National Academy Press</li><li>9) Henry, J.G., &amp; Heinke, G.W. (1996). <i>Environmental Science and Engineering</i>. Prentice Hall,</li></ol>



<b>Course Code: CE-4845</b> <b>Credit Hours: 2</b>	<b>Course Title: Environmental and Sustainable management</b> <b>Contact hours: 2 Hrs per Week</b>
<b>Section-A</b> <b>(Mid-term Exam:30 Marks )</b>	
Environment and Development Projects: environment and sustainable development	
<b>Section-B (Final Exam: 50 Marks)</b> <b>Group-A (20 Marks)</b>	
Environmental policies and legislation; environmental implication of sectoral development: environmental quality standards;	
<b>Group-B (30 Marks)</b>	
Environmental issues priorities; environmental impact assessment of development schemes-baseline studies, assessment methodologies; economic of environmental management; special topics.	
<b>Recommended Books:</b>	<ol style="list-style-type: none"> <li>1) Harmancioglu, N, Fistikoglu, O., &amp; Singh, V.P. (2010). <i>Water Quality Monitoring Network Design</i>. Springer.</li> <li>2) Willis, R., &amp; Finney, B.A. (2003). <i>Environmental Systems Engineering an Economic</i>. Springer.</li> <li>3) Hipel, K.W., &amp; Mcleod, I. (2010). <i>Stochastic and Statistical Methods in Hydrology and Environmental Engineering</i>. Springer.</li> <li>4) Panu, U.S., Singh, V.P., Harmancioglu, N., Singh, V.P., Alpaslan, M.N. <i>Environmental Data Management</i>.</li> <li>5) Surhone, L.M., Timpledon, M.T., Marseken, S. F. <i>Environmental Engineering</i>.</li> <li>6) Peavy, H.S., Rowe, D.R., &amp; Tchobanoglous, G. (1984). <i>Environmental Engineering</i>.</li> <li>7) McGraw-Hill.</li> <li>8) Nemerow, N.L., Agardy, F.J., Joseph A. , &amp; Schulze, S.P. (1998). <i>Engineering within Ecological Constraints</i>. National Academy Press</li> <li>9) Henry, J.G., &amp; Heinke, G.W. (1996). <i>Environmental Science and Engineering</i>. Prentice Hall,</li> </ol>

**SESSIONAL**

<b>Course Code: CE-4844</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Environmental Pollution Management Sessional</b> <b>Contact hours: 3 Hrs per Week</b>
<b>Course content</b>	Sessional based on CE-4843

<b>Course Code: CE-4846</b> <b>Credit Hours: 1.5</b>	<b>Course Title: Environmental and Sustainable Management Sessional</b> <b>Contact hours: 3 Hrs per Week</b>
<b>Course content</b>	Sessional based on CE-4845



## OPTION-V (Water Resource Engineering)

Course Code: CE-4851 Credit Hours: 2		Course Title: Flood mitigation and management Contact hours: 2 Hrs per Week	
<b>Course Content:</b>	<ul style="list-style-type: none"><li>Flood and its causes; methods of flood management: structural and non structural measures such as reservoirs, levees and flood walls, channel improvement, interior drainage, floodways, land management, flood proofing, flood zoning, flood hazard mapping, flood forecasting and warning.</li><li>Economic aspects of flood management: flood risk and vulnerability analysis, direct and indirect losses of flood, flood damage assessment, flood damage in urban and rural areas</li></ul>		
<b>Recommended Books:</b>	<ol style="list-style-type: none"><li>Japanese Commission on Large Dams.(2009).<i>Dams in Japan</i>. CRC Press.</li><li>Surhone, L.M., Timpledon, M.T., &amp; Marseken, S.F..<i>Somerville Lake</i>.</li><li>Ojha, Bhunya, &amp; Berndtsson. (2008). <i>Engineering Hydrology</i>. Oxford University Press.</li><li>Hayes, W.P.(2009). <i>Dams,: Impacts, Stability and Design</i>. Nova Science Pub Inc.</li><li>Singh, V.P. (1997). <i>Environmental Hydrology</i>. Wiley-Inter Science.</li><li>Ward, A.(2003). <i>Environmental Hydrology</i>. CRC Press.</li><li>Todd, D. K., &amp; Mays, L.W.(2004). <i>Groundwater Hydrology</i>. Wiley.</li><li>Bedient, P.,&amp; Huber, W.C.(2012). <i>Hydrology and Floodplain Analysis</i>. Prentice Hall.</li><li>Shaw, E.L.(2010). <i>Hydrology in Practice</i>. CRC Press.</li></ol>		

Course Code: CE-4853 Credit Hours: 2		Course Title: Hydraulic Structures Contact hours: 2 Hrs per Week	
<b>Course Content:</b>	Principles of design of hydraulic structures, types of hydraulic structures, Design of dams: Earthen and Gravity dams, barrages, weirs, spillways, spillway gates, cross drainage works.		
<b>Recommended Books:</b>	<ol style="list-style-type: none"><li>Novak, P., Moffat, A.I.B., &amp; Narayanan, R. (2001). <i>Hydraulic Structures</i>. CRC Press.</li><li>Erbisti, P. C.F. (2014). <i>Design of Hydraulic Gates</i> CRC Press.</li><li>May, R., Bromwich, B.C., &amp; Gasowski, Y. (2003).<i>Hydraulic Design of Side Weirs</i>. Thomas Telford Publishing.</li><li>Army Corps, U.S. (2005). <i>Design of Hydraulic Steel Structures</i>. University Press of the Pacific.</li><li>Wu, Y. (2011).<i>Vibration and Oscillation of Hydraulic Machinery</i>. Imperial College Press.</li><li>Peterka, A.J. (2005). <i>Hydraulic Design of Stilling Basins and Energy Dissipaters</i>. University Press of the Pacific.</li><li>Stewart, B.A. <i>Soil Structure</i></li><li>Chakrabarti , S.K. <i>Offshore Structure Modeling</i></li><li>Federal Highway Administration. (2012). <i>Urban Drainage Dressing</i>. Bibliography Gov.</li></ol>		



<b>Course Code: CE-4855</b>		<b>Course Title: Ground Engineering</b>	
<b>Credit Hours: 2</b>		<b>Contact hours: 2 Hrs per Week,</b>	
<b>Course Content:</b>	Groundwater in hydrologic cycle and its occurrence, Physical properties and principles of ground water movement, Groundwater and well hydraulics, Groundwater resources evaluation, Groundwater levels and environmental influences, Water mining and Land subsidence, Ground water pollution and contaminant transport. Recharge of groundwater, Saline water instruction in aquifers, Groundwater management.		
<b>Recommended Books:</b>	<ol style="list-style-type: none"> <li>1) Unwal, P.A.(2006). <i>Planning and Managing of Water Resources</i>. Novinka Books.</li> <li>2) Todd, D.K., &amp; Larry Mays, M.(2004). <i>Groundwater Hydrology</i>. Wiley.</li> <li>3) Paolo Squatriti,P. <i>Managing Water in Medieval Europe</i>. Technology and Resources.</li> <li>4) Linsely, R.K. ,Franzini, J.B., Freyberg, D.L.,&amp; Tchbanoglous, G. (1991). <i>Water Resources Engineering</i>. McGraw-Hill.</li> <li>5) Whipple,W.(1988). <i>Water Resources: A New Era for Coordination</i>. ASCE Press.</li> <li>6) Brebbia, C.A., &amp; Popov, V.(2009). <i>Water Resources Management V</i>. WIT Press.</li> <li>7) Surhone, L.M.,Timpledon, M.T,&amp; Marseken, S.F. <i>Oahe Dam</i>.</li> </ol>		

<b>Course Code: CE-4857</b>		<b>Course Title: River Engineering</b>	
<b>Credit Hours: 2</b>		<b>Contact hours: 2 Hrs per Week,</b>	
<b>Course Content:</b>	Behavior of alluvial rivers, River channel pattern and fluvial process. Aggradations and degradation, local scour, Navigation, Sediment movement in river channels, bed forms and flow regimes.		
<b>Recommended Book</b>	<ol style="list-style-type: none"> <li>1) Shastri, P. (2009). <i>Rivers, Dams and Development Issues and Dilemmas</i>. SBS Publishers.</li> <li>2) Batuca, D.G., Jordaan, J.M., &amp; Jordaan, J.M (2000). <i>Silting and Dusting of Reservoirs</i>.</li> <li>3) CRC Press.</li> <li>4) Vymazal, J. (2008). <i>Wastewater Treatment, Plant Dynamics and Management in Constructed and Natural Wetlands</i>. Springer.</li> <li>5) Tuin, J.D.V. (1987). <i>Elsevier's Dictionary of Water and Hydraulic Engineering</i>. Elsevier Science.</li> </ol>		

<b>Course Code: CE-4859</b>		<b>Course Title: Coastal Engineering</b>	
<b>Credit Hours: 2</b>		<b>Contact hours: 2 Hrs per Week,</b>	
<b>Course Content:</b>	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.		



## SESSIONAL

<b>Course Code:</b> CE-4852 <b>Credit Hours:</b> 2	<b>Course Title:</b> Hydraulic Structures Sessional <b>Contact hours:</b> 2 Hrs per Week,
<b>Course Content:</b>	Design of hydraulic structures, river training works; groundwater resource assessment and water well design.

<b>Course Code:</b> CE-4854 <b>Credit Hours:</b> 2	<b>Course Title:</b> Hydraulic Structures Sessional <b>Contact hours:</b> 2 Hrs per Week,
<b>Course Content:</b>	Design of hydraulic structures, river training works; groundwater resource assessment and water well design.



*The End*



আন্তর্জাতিক ইসলামী বিশ্ববিদ্যালয় চট্টগ্রাম  
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