

Course No: 01 Course Title: Introduction to Computer Programming

Course Code: CSE 1101

Credit: 3.00

Contact Hours: 3 Hours/Week

Pre-Requisites: Nil

Total Marks: 100

Mark Distribution:

Semester Final Exam: 72 Marks Class Test: 20 Marks Class Attendance: 08 Marks

11.1 Rationale:

To become a successful computer professional, one must have in-depth knowledge on computer programming. This course will establish the foundation of programming among the students.

11.2 Objectives:

1. Receive a basic knowledge of programming and the ability of reading with understanding programs.
2. Able to solve basic programming problems using a variety of skills and strategies.
3. Examine working programs to identify their structures and apply appropriate techniques to create entry-level programs

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a.	Learn how to begin journey into programming	Programming, Programming Language, Compiler, IDE	Lecture	Quiz
a.	Learn C Programming Basics	Header File C Printf and Scanf Functions Keywords Variables Data Types Constants Comments Operators	Lecture Exercise Demonstration	Quiz Assignment Practical Exam
a.	Verify control statements	If Statement in C If Else Statement in C If and Else If Ladder Statement Switch Statement	Lecture Exercise Demonstration	Quiz Assignment Practical Exam
b.	Apply control structures			
a.	Explain functions	Function In C Introduction with Example Function: Example with Parameters Function : Call by Value Function : Call by Reference Recursion in C	Lecture Exercise Demonstration	Quiz Assignment Practical Exam
b.	Apply functions and recursion			
c.	Explain scope rules and storage classes			
d.	Distinguish between local and global variables			
a.	Implement loops	For loop While loop do-while loop	Lecture Exercise Demonstration	Quiz Assignment Practical Exam
a.	Apply arrays, strings and pointers	Array in C Array example (Input and Output in an Array) 2D Array example	Lecture Exercise Demonstration	Quiz Assignment Practical Exam
	Differentiate among			

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
b.	arrays, strings and pointers	Passing array to function Pointer to Pointer Pointer Arithmetic Dynamic Memory Allocation Malloc String in C C Gets and Puts Method C String Function C Math Function		
a.	Explain user defined data types	User defined data type: structures, unions, enumeration;	Lecture Exercise Demonstration	Quiz Assignment Practical Exam
a.	Explain input-output	Input and output: standard input and output, formatted input and output	Lecture Exercise Demonstration	Quiz Assignment Practical Exam
a.	Apply file I/O	File Handling Write Data to File File Handling Read Data to File C Pre Processor Directive with Example	Lecture Exercise Demonstration	Quiz Assignment Practical Exam
a.	Explain and apply argument list	Variable length argument list; Command line parameters	Lecture Exercise Demonstration	Quiz Assignment Practical Exam

Recommended Books And Periodicals		
	Authors	Book Name
1.	Reema Thareja	Computer fundamentals and programming
2.	Peter Prinz	C in a Nutshell: The Definitive Reference
3.	Y. Kanitkar	Let Us C
4.	H. Schildt	Teach yourself C
5.	H. Schildt	C: The Complete Reference
6.	Griffiths David	Head First C
7.	Kernighan & Ritchie	The C programming language
8.	Peter Van Der Linden	Expert C programming
Course No:	02	Course Title: Introduction to Computer Programming Lab
Course Code: CSE 1102		Pre-Requisites: Nil
Credit: 1.5		Total Marks: 100
Contact Hours: 3 Hours/Week		
<u>Mark Distribution:</u>		
Lab Final Exam:	60 Marks	Viva: 30 Marks Class Attendance: 10 Marks

11.1 Rationale:

To become a successful computer professional, one must have in-depth knowledge on computer programming. This course will establish the foundation of programming among the students.

11.2 Objectives:

1. Receive a basic knowledge of programming and the ability of reading with understanding programs.
2. Able to solve basic programming problems using a variety of skills and strategies.
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11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a.	Learn how to begin journey into programming	Programming, Programming Language, Compiler, IDE	Lecture	Quiz
a.	Learn C Programming Basics	Header File C Printf and Scanf Functions Keywords Variables Data Types Constants Comments Operators	Lecture Exercise Demonstration	Quiz Assignment Practical Exam
a.	Verify control statements	If Statement in C If Else Statement in C If and Else If Ladder Statement Switch Statement	Lecture Exercise Demonstration	Quiz Assignment Practical Exam
b.	Apply control structures			
a.	Explain functions	Function In C Introduction with Example Function: Example with Parameters Function : Call by Value Function : Call by Reference Recursion in C	Lecture Exercise Demonstration	Quiz Assignment Practical Exam
b.	Apply functions and recursion			
c.	Explain scope rules and storage classes			
d.	Distinguish between local and global variables			
a.	Implement loops	For loop While loop do-while loop	Lecture Exercise Demonstration	Quiz Assignment Practical Exam
a.	Apply arrays, strings and pointers	Array in C Array example (Input and Output in an Array) 2D Array example Passing array to function Pointer to Pointer Pointer Arithmetic Dynamic Memory Allocation Malloc String in C C Gets and Puts Method C String Function C Math Function	Lecture Exercise Demonstration	Quiz Assignment Practical Exam
b.	Differentiate among arrays, strings and pointers			
a.	Explain user defined data types	User defined data type: structures, unions, enumeration;	Lecture Exercise Demonstration	Quiz Assignment Practical Exam
a.	Explain input-output	Input and output: standard	Lecture	Quiz

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
		input and output, formatted input and output	Exercise Demonstration	Assignment Practical Exam
a.	Apply file I/O	File Handling Write Data to File File Handling Read Data to File C Pre Processor Directive with Example	Lecture Exercise Demonstration	Quiz Assignment Practical Exam
a.	Explain and apply argument list	Variable length argument list; Command line parameters	Lecture Exercise Demonstration	Quiz Assignment Practical Exam

Recommended Books And Periodicals		
Authors		Book Name
1.	Reema Thareja	Computer fundamentals and programming
2.	Peter Prinz	C in a Nutshell: The Definitive Reference
3.	Y. Kanitkar	Let Us C
4.	H. Schildt	Teach yourself C
5.	H. Schildt	C: The Complete Reference
6.	Griffiths David	Head First C
7.	Kernighan & Ritchie	The C programming language
8.	Peter Van Der Linden	Expert C programming

Course No:	03	Course Title:	Discrete Mathematics		
Course Code: CSE-1103		Pre-Requisites: Nil			
Credit: 3.00		Total Marks: 100			
Contact Hours: 3 Hours/Week					
<u>Mark Distribution:</u>					
Semester Final Exam:		72 Marks	Class Test:	20 Marks	Class Attendance: 08 Marks

11.1	Rationale:
To be a computer professional, one needs to have solid background on mathematical logic, number theory, functions and relations, graphs, trees.	
11.2	Objectives:

1. Explain mathematical logic and set theory deeply.
2. Be able to apply number theory, functions and relations.
3. Have in depth understanding of and be able to construct graphs and trees.

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a.	Describe logic	Mathematical Logic: Statements and Notation. Connectives: Negation,	Lecture Exercise Demonstration	Quiz Short Answer Assignment
b.	Apply logical operations			

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
c.	State and prove Normal Forms, Ordering Quantifiers, Predicates formulas	Conjunction, Disjunction, Statement Formulas and Truth Tables. Conditional and Bi-conditional. Tautologies. Equivalence of Formulas. Duality Law. Tautological Implications. Normal Forms, Ordering and Uniqueness of Normal Forms. Rules of Inference. Methods of Proof. Predicate Calculus: Predicates, Statement Function, Variables, and Quantifiers, Predicate Formulas, Free and Bound Variables, The Universe of Discourse. Rules of Inference: Universal Specification & Generalization, Existential Specification & Generalization, Mathematical Induction		
a.	Apply and Analyse Modular Arithmetic and the Euclidean Algorithm	Elements of Number Theory: Modular Arithmetic, and The Euclidean Algorithm	Lecture Exercise Demonstration	Quiz Short Answer Exercise
a.	Describe Relation of function	Relations and Functions: Properties of Binary Relations, Composition of Binary Relations, Relation matrix and Graph of a Relation. Functions: Characteristic function, Floor function, Ceiling function and Hashing functions.	Lecture Exercise Demonstration	Quiz Short Answer Assignment
b.	Apply Properties of binary Relation Composition of binary relation, relation matrix			
c.	Determine ceiling function and Hashing function			
a.	Define Graph	Graphs: Introduction, definition and terminology, graph representations, traversals, connected components and spanning trees, shortest path and transitive closure, activity networks, topological sort and critical paths, enumerating all paths	Lecture Exercise Demonstration	Short Answer Exercise
b.	Construct graph			
c.	Apply graph traversal techniques			
a.	Identify Tree	Trees: Basic terminology, Binary trees, binary tree representations, binary tree traversal; Binary search tree, tree search, Insert into a search tree, tree sort algorithm, deletion from a search tree, Building a binary search tree, Inserting a node, AVL trees, Forming a heap	Lecture Exercise Demonstration	Short Answer Exercise
b.	Construct Tree			
c.	Analyse Tree			
a.	Identify groups	Elements of Group Theory: Semi groups, Isomorphism and Homomorphism of Semi groups,	Lecture Exercise Demonstration	Short Answer Exercise

11.3	11.4	11.5	11.6
Learning Outcomes	Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
	Groups, Group Homomorphism.		

Recommended Books And Periodicals		
	Authors	Book Name
1.	SeymourLipschutz and, Marc Lipson	Schaum's Outline of Discrete Mathematics
2.	K. H.Rosen	Discrete Mathematics and its Applications
3.	Koleman& Busby	Discrete Mathematical Structures for Computer Science
4.	Trembley&Manohar	Discrete Mathematical Structures with Applications to Computer Science
Course No:	04	Course Title: Fundamentals of Electrical and Electronics

Course Code: EEE 1101	Pre-Requisites: Nil
Credit: 3.00	Total Marks: 100
Contact Hours: 3 Hours/Week	
Mark Distribution:	
Semester Final Exam: 72 Marks	Class Test: 20 Marks
Class Attendance: 08 Marks	

11.1 Rationale: <p>To be a computer engineer, one needs to study and apply electricity and electromagnetism in different electrical applications.</p>
11.2 Objectives: <ol style="list-style-type: none"> To understand about concept of current, voltage and power. To learn and study of DC network theorems and solve circuits. To know about magnetic circuits and different magnetic theorem. To know about ac fundamentals and solve different ac circuits.

11.3	11.4	11.5	11.6
Learning Outcomes	Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a. Define and discuss Electric current.	Fundamental electrical concepts: Different measuring units	Lecture, Exercise	Short Answer, Essay, Assignment
a. Define different electrical parameters.	DC voltage, current, resistance and power; Series, networks definitions, mesh and node circuit analysis, reduction of a complicated network, conversion between T and π section.	Lecture, Exercise, Assignment, Group Discussion	Short Answer, Essay, Assignment, Exercise
b. State and explain different electric network circuits.			
c. Calculate circuit's parameters.			
a. State and explain different network theorem and laws	Networks transformations: Equivalent circuit, Superposition theorem, the reciprocity theorem, Thevenin's theorem, Norton's theorem, Maximum power	Lecture, Exercise, Assignment	Assignment, Short Answer, Exercise
b. Analyze different network theorem and			

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
	laws.	transfer theorem.		
a.	State and explain magnetic laws.	Introduction to magnetic Circuit: Transformer working principle, construction, and maintenance, transformer's e.m.f equations, transformer regulation and efficiency, different types of transformer.	Lecture, Exercise, Assignment	Assignment, Short Answer, Exercise
b.	Calculate self and mutual inductance of electric circuits.			
a.	State and explain magnetic laws.	Electromagnetic Field: Maxwell's Equation, Electromagnetic wave equation and propagation, Pointing vector, Faraday's laws of electromagnetic induction, Lenz's Law, Motional e.m.f, Eddy current. Self and Mutual Inductance.	Lecture, Exercise, Assignment	Short Answer, Essay, Assignment
b.	Solve different magnetic networks.			
a.	Summarize the properties of Capacitor.	Capacitor and Capacitance: Capacitance, Parallel plate capacitor, cylindrical capacitor, spherical capacitor, capacitors in series & parallel, energy stored in a capacitor, transformers.	Lecture, Reading, Assignment	Short Answer, Essay, Assignment, Exercise
b.	Define and explain different types of capacitor.			
c.	Draw and describe capacitor circuits.			
a.	Define and explain ac network terms.	A.C Circuits: Instantaneous and r.m.s. values of current, voltage and average power, Use of complex quantities in AC circuits, resonant circuits, Q value and band width, frequency response.	Lecture, Reading, Assignment, Group Discussion	Short Answer, Essay, Assignment, Exercise
b.	Derive AC values.			
c.	Design and solve series and parallel AC circuits.			
d.	Compare dc and ac networks.			
b.	Define and explain different types of filters.			

Recommended Books And Periodicals		
Authors	Book Name	
1. B.L. Theraja	A text book of Electrical Technology, Volume: I.	
2. V. K. Mehta	Principles of Electrical Engineering and Electronics.	
3. G. F. Corcoran	Alternating Current Circuits.	
4. Corson and Lorrain	Introduction to Electromagnetic Field and Waves	

Course No:	05	Course Title:	Fundamentals of Electrical and Electronics Lab		
Course Code: EEE 1102		Pre-Requisites: Nil			
Credit: 1.50		Total Marks: 100			
Contact Hours: 3 Hours/Week					
<u>Mark Distribution:</u>					
Lab Final Exam:		60 Marks	Viva:	30 Marks	Class Attendance: 10 Marks

11.1 Rationale:

To be a computer engineer, one needs to practically apply electricity and electromagnetism in different electrical applications.

11.2 Objectives:

- 1. To familiarize with different electrical components and measuring instruments.
- 2. To verify different laws and theorems in basic circuits.

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a.	Identify resistor, capacitor, and inductor.	Familiarization with different electrical components and measuring instruments.	Lecture, Demonstration	Assignment, Practical Exam, Viva, Reports
b.	Identify measuring instruments.			
a.	Perform ohm’s and kirchhoff’s law.	Ohm’s law, kirchhoff’s law.	Lecture, Demonstration	Assignment, Practical Exam, Viva, Reports
a.	Design of series, parallel and series-parallel circuit.	Series circuit, Parallel circuit and series parallel circuit.	Lecture, Demonstration	Assignment, Practical Exam, Viva, Reports
a.	Perform different theorem in practical circuits.	Thevenin’s theorem, Norton’s theorem, superposition theorem, Reciprocity theorem, Maximum power transfer theorem	Lecture, Exercise, Assignment	Assignment, Practical Exam, Viva, Reports

Recommended Books And Periodicals

Authors		Book Name
1.	B. L. Theraja	A text book of Electrical Technology, Volume: I.
2.	V. K. Mehta	Principles of Electrical Engineering and Electronics.
3.	G. F. Corcoran	Alternating Current Circuits.
4.	Corson and Lorrain	Introduction to Electromagnetic Field and Waves

Course No: 06 Course Title: Integral Calculus and Geometry

Course Code: MATH 1101

Credit: 3.00

Contact Hours: 3 Hours/Week

Pre-Requisites: Nil

Total Marks: 100

Mark Distribution:

Semester Final Exam: 72 Marks **Class Test:** 20 Marks **Class Attendance:** 08 Marks

11.1 Rationale:

To be a computer Engineer one has to have sound knowledge about function, limit, Derivatives, applications of differentiation, integrals and application of integration

11.2 Objectives:

- 1. To Learn about various limit problems algebraically and graphically.
- 2. To Examine and Apply the continuity and differentiability of various types of function.
- 3. To gain knowledge about Integration and application of Integration.

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
1.	Know the Mathematical Models and Commonly used Functions	Functions: Graphing Functions, Mathematical Models and Commonly used Functions (Linear, Polynomial, Power), Mathematical Models and Commonly Used Functions (Algebraic, Trigonometric, Exponential, and Logarithmic Functions), Transformations (Scaling, Reflection, Composition), Inverse of Functions, Growth of Functions.	Lecture Exercise	Assignment Essay Exercise Short Answer
2.	Learn Graphing Functions			
3.	Learn about Inverse of Functions and Growth of Functions.			
1.	Define limit and continuity.	Limits: Concepts, One Sided Limits, Infinite limits, Limit Laws, Sandwich Theorem, Formal Definition of Limits and Continuity of Functions, Intermediate Value Theorem and Its Application, Limits at Infinity and the Horizontal Asymptotes.	Lecture Exercise	Assignment Essay Exercise Short Answer
2.	Learn the Limit Laws and Sandwich Theorem			
3.	Learn the Intermediate Value Theorem and its application			
1.	Learn about Derivatives and Rate of Change	Derivatives: Derivatives and Rate of Change, Derivatives as Functions, Differentiability of Functions, Rules and Techniques of Differentiation.	Lecture Exercise	Assignment Essay Exercise Short Answer
2.	Rules and Techniques of Differentiation			
1.	Know about Rates of Change, Exponential Growth and Decay	Applications of Differentiation: Rates of Change in Natural and Social Sciences, Exponential Growth and Decay, Linear Approximation and Differentials, Finding Minimum and Maximum Value of Functions and the first and Second Derivative Tests, Indeterminate Forms and L'Hospital's Rule, Curve Sketching.	Lecture Exercise	Assignment Essay Exercise Short Answer
2.	Learn about Linear Approximation and Differentials			
3.	Determine the maximum and minimum value of Function			
4.	Learn Forms and L'Hospital's Rule			
1.	Learn the Riemann Sum and Definite Integrals	Integrals: Riemann Sum and Definite Integrals, Properties of Integrals, Fundamental Theorem of Calculus, Anti-Derivative and Indefinite Integral, Net	Lecture Exercise	Assignment Essay Exercise Short
2.	Know the			

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
	properties of Integrals	Change Theorem, Substitution Rule.		Answer
3.	Learn the Fundamental Theorem of Calculus			
4.	Learn the Net Change Theorem and Substitution Rule			
1.	Finding Area between Curves	Application of Integration: Finding Area between Curves, Volumes, Volumes by Cylindrical Shells, Average Value of a Function, Mean Value Theorem for Integrals.	Lecture Exercise	Assignment Essay Exercise Short Answer
2.	Find the Average Value of a Function			
3.	Learn Mean Value Theorem for Integrals			

Recommended Books And Periodicals		
Authors	Book Name	
1. Howard Anton	Calculus	
2. Thomas Finney	Calculus and Analytical Geometry	
3. E.R. Swokowski	Calculus with Analytic Geometry	
4. M.R. Spiegel	Advanced Calculus	
5. S.P. Gordon	Calculus and the Computer.	

Course No:	07	Course Title:	Chemistry for Computer Engineers
Course Code:	CHEM-1101	Pre-Requisites:	Nil
Credit:	2.00	Total Marks:	100
Contact Hours:	2 Hours/Week		
Mark Distribution:			
Semester Final Exam:	72 Marks	Class Test:	20 Marks
		Class Attendance:	08 Marks

11.1 Rationale:

A computer scientist or engineer may choose to be expert in cheminformatics or computational chemistry. Therefore, he or she should have a sound knowledge and deep understanding of chemistry.

11.2 Objectives:

- Know the crystal symmetry.
- Understand the characteristics of solution.
- Explain chemical equilibrium.
- Learn basics of nuclear chemistry.

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a.	Explain crystal symmetry	Different methods for the determination of structure; Structures of the metallic elements and certain compounds with three dimensional lattices; Defects in solid; Semiconductors: Structures of Si, Ge, B, N, P, In. Types of Semiconductor, Electronic and band theory.	Lecture, Assignment	Short Answer, Essay, Assignment
a.	Identify and explain solution	Type of solutions, Units of concentration. Solution of gas in liquid, Henry's law. Solution of solid in liquid, solubility curve. Distribution law and its application. Solvent extraction, Colligative properties of dilute solution.	Lecture, Assignment	Short Answer, Essay
a.	Explain chemical equilibrium	Law of mass-action, Chemical equilibrium and Equilibrium Constants, Application of law of mass-action to Homogeneous and Heterogeneous Equilibrium, Le-Chatelier Principle, Applications of principle of mobile equilibrium to reaction of industrial importance.	Lecture, Assignment	Short Answer, Essay
a.	Learn nuclear chemistry	Radioactivity, Patterns of Nuclear Stability, Nuclear Transmutations, Rates of Radioactive Decay, Detection of Radioactivity, Energy Changes in Nuclear Reactions, Nuclear Fission, Nuclear Fusion, Isotopes, Isobar, Isomers, Methods of Separation of Isotopes, Applications of Radioisotopes, Biological Effects of Radiation.	Lecture, Assignment	Short Answer, Essay

Authors		Book Name
G.M. Barrow		Physical Chemistry
M.M. Haque and M.A.Nawab		Principles of Physical Chemistry
B. S. Bhal and G. D. Tuli		Essential of Physical Chemistry
S. Z. Haider		Introduction to Modern Inorganic Chemistry
R.D. Madan		Modern Inorganic Chemistry
S. Gilreath		Fundamental Concepts of Inorganic Chemistry
R. M. Felder and R. W. Rousseau		Elementary Principles of Chemical Engineering

Course No: 08	Course Title: Bangladesh Studies
Course Code: HUM 1101	Pre-Requisites: Nil
Credit: 2.00	Total Marks: 100
Contact Hours: 2 Hours/Week	
Mark Distribution:	
Semester Final Exam: 72 Marks	Class Test: 20 Marks Class Attendance: 08 Marks

11.1 Rationale:

Each and every individual of a country should have adequate knowledge about the history, culture, economical and sociological aspects of his own country. Bangladesh Studies will provide students an overall view of the Land and People, Emergence of Sovereign State, Political Culture and Administration, Natural Resources, Economy and Sociology of Bangladesh.

11.2 Objectives:

1. Acquire knowledge about economy and sociology of Bangladesh.
2. Understand the history and culture of Bangladesh.
3. Gather clear concept about political culture and administration of Bangladesh

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a.	Knowledge about Land and People of Bangladesh	Land and People: A brief history, Culture, Language and Religion of the land; Population, Ethnological origin and Occupation/Profession of the people.	Lecture	Short Answer, Essay
b.	Knowledge about Emergence of Sovereign State of Bangladesh	Emergence of Sovereign State: Economic factors; Political factors: Language movement (1952), Six Point Movement (1966), Mass upsurge (1969); Bangabandhu and Independence of Bangladesh (1971).	Lecture	Short Answer, Essay
c.	Knowledge about Political Culture and Administration of Bangladesh	Political Culture and Administration: Introduction to the Bangladesh Constitution; Forms of Government since independence; Democracy; Administrative System in Bangladesh.	Lecture	Short Answer, Essay
d.	Knowledge about Economy of Bangladesh	Economy: Introduction to Bangladesh economy, Major economic Sectors: Agriculture, Industry and Services; Role of Women in national economy. Economics of development and planning, basic concept-saving, investment, GNP, NNP. Fiscal policy, monetary policy and trade policy, some planning tools-capital output ratio, input analysis.	Lecture	Short Answer, Essay
e.	Knowledge about Sociology of Bangladesh	Sociology: Scope, Social evolution and techniques of production, Culture and	Lecture	Short Answer, Essay

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
		civilization, Social structure of Bangladesh. Population and world resources. Oriental and Occidental societies, Industrial revolution. Family - Urbanization and industrialization, Urban Ecology, Co-operative and socialist movements, rural sociology.		

Recommended Books And Periodicals		
Authors	Book Name	
1. S. Islam	Banglapedia. National Encyclopedia, Asiatic Society of Bangladesh, Dhaka	
2. S. A.Kibria	Bangladesh at the Crossroads. University Press Ltd	
3. A.Riaz	Bangladesh: A Political History since Independence. London: IB Taurus	

Course No:	09	Course Title:	English Language Skill Lab
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Course Code: ENG-1102
Credit: 1.00
Contact Hours: 2 Hours/Week

Pre-Requisites: Nil
Total Marks: 100

Mark Distribution:			
Lab Final Exam:	60 Marks	Viva:	30 Marks
		Class Attendance:	10 Marks

11.1 Rationale:

To be a global IT expert, a student must have the communication skill in an international language and English is the most and widely used language. Therefore, learning Communicative English is a must for a CSE student.

11.2 Objectives:

1. Talk about themselves, their families and their weekly schedules.
2. Memorize and use various set phrases for use in all of their classes.
3. Ask questions of other members of the class in English to help carry on a conversation and to expand on a topic.
4. Identify various parts of an English newspaper and predict the topic of the article based on the headline.
5. Make a video of themselves and reflect on their improvement over the course of the semester.
6. Understand the importance of their learning portfolio and demonstrate their knowhow on how to make one for their courses.

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a.	Recognizing the importance of four communication skills(Reading, Writing,	Reading Comprehension, vocabulary building, précis/summarizing, development of writing skill,	Lecture, Demonstration, Exercise, Group Study,	Exercise, Assignment, Short Answer, Report

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
	Listening, and Speaking	paragraph development, report writing, letter writing (formal/informal), newspaperarticle writing. Parts of Speech, Subject-Verb agreement, Articles, Tense form, Phrase & Clause, Making Questions, Gerund and Participle, Appropriate preposition, Word formation processes, Verbs & adjectives, Using dictionary, Real life word associated with science & technology, Places, clothes, foods, shopping, family, hobbies, health, entertainment, transport and education.	Case Study	Writing
b.	Learning new words from newspapers and articles			
c.	Identify parts of speech			
d.	Differentiate tenses, phrases and clauses			
e.	Locate words in the dictionary			
f.	Explain Sentence structures			
g.	Classify sentences			
h.	Converse in English			

Recommended Books And Periodicals		
Authors	Book Name	
1. Wren & Martin	High school English Grammar” S. Chand & Company	
2. Raymond Murphy	Intermediate English Grammar	
3. Jones Leo	Communicative Grammar Practice	
4. John Eastwood	Oxford Practice Grammar	
5. Sadruddin Ahmed	Learning English The Easy Way.	

Course No:	10	Course Title:	Data Structure
Course Code:	CSE-1201	Pre-Requisites:	Nil
Credit:	3.00	Total Marks:	100
Contact Hours:	3 Hours/Week		
Mark Distribution:			
Semester Final Exam:	72 Marks	Class Test:	20 Marks
		Class Attendance:	08 Marks
11.1 Rationale:			

To become a successful computer professional, one needs to have in depth knowledge of data structures to apply them in problem solving and algorithms to analyze different solutions to problems.

11.2 Objectives:
1. Apply different data structures to problem solving
2. Explain different algorithms of solutions to problems.
3. Analyze different problem solutions

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a.	Apply stacks, queues and recursion	Stacks, Queues and Recursion: Fundamentals,Different types of stacks and queues: Circular,	Demonstration Exercise	Assignment Practical Exam
b.	Differentiate between stacks and queues			

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
c.	Evaluate expressions using stacks	dequeues etc.; evaluation of expressions, multiple stacks and queues; Recursion: Direct and indirect recursion, depth of recursion; Simulation of Recursion: Removal of Recursion; Towers of Hanoi.		
d.	Analyze recursive functions			
a.	Construct graphs and trees	Elements of Graphs and Trees: Graph Terminology, Paths and Circuits, Connectedness, Matrix Representation of Graph and Isomorphism of graphs. Trees, Rooted trees, Path Lengths in Rooted Trees.	Demonstration Exercise	Assignment Practical Exam
b.	Differentiate between graphs and trees			
a.	Construct linked lists	Linked Lists: Single linked lists, Linked stacks and queues, the storage pool, polynomial addition, equivalence relations, sparse matrices, doubly linked lists and dynamic storage management, generalized lists, garbage collection and compaction.	Demonstration Exercise	Assignment Practical Exam
b.	Apply linked lists to stacks and queues			
c.	Analyze memory allocation			
a.	Construct and apply extended binary trees	Extended binary trees: 2-trees, internal and external path lengths, Huffman codes/algorithm; Threaded binary trees, binary tree representation of trees; Application of Trees: Set representation, decision trees, game trees; Counting binary trees.	Demonstration Exercise	Assignment Practical Exam
a.	Apply sorting algorithms	Sorting: Searching, bubble sort, shell sort, insertion sort, selection sort, quick sort, heap sort, 2-way merge sort, sorting on several keys, practical considerations of internal sorting. searching, hash techniques.	Demonstration Exercise	Assignment Practical Exam
b.	Distinguish among sorting algorithms			
a.	Apply algorithmic techniques Analyze algorithms	Algorithms: Techniques for analysis of algorithms; Algorithmic Techniques: divide-and-conquer, greedy method, dynamic programming, backtracking, branch and bound; Flow algorithms. Topological sorting; Connected components; spanning trees; Shortest paths; Algebraic simplification and transformations; Lower bound	Demonstration Exercise	Assignment Practical Exam

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
		theory; NP-completeness; NP-hard and NP-complete problems; Approximation Algorithms; Introduction to parallel algorithms.		

Recommended Books And Periodicals		
Authors		Book Name
1.	S. Lipschutz	Theory and Problem of Data Structures
2.	E. Horowitz	Data Structure
3.	D. E. Knuth	The Art of Computer Programming, Vol. 1, Fundamental Algorithms
4.	D. E. Knuth	The Art of Computer Programming, Vol. 2, Semi-numerical Algorithms
5.	D. E. Knuth	The Art of Computer Programming, Vol. 3, Sorting and Searching
6.	Goodman	Introduction to Design and Analysis of Algorithms
7.	Robert Sedgewick	Algorithms
8.	Ellis Horowitz & Sartaj Sahni	Fundamentals of Computer Algorithms

Course No:	11	Course Title:	Data Structure Lab
Course Code:	CSE-1202	Pre-Requisites:	Nil
Credit:	1.5	Total Marks:	100
Contact Hours:	2 Hours/Week		
Mark Distribution:			
	Lab Final Exam:	60 Marks	Viva: 30 Marks
			Class Attendance: 10 Marks

11.1 Rationale:

To become a successful computer professional, one needs to have in depth knowledge of data structures to apply them in problem solving and algorithms to analyze different solutions to problems.

11.2 Objectives:

1. Apply different data structures to problem solving
2. Explain different algorithms of solutions to problems.
3. Analyze different problem solutions

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a. Apply and perform operations on arrays b. Calculate memory requirements		Elementary data structures, arrays	Exercise	Practice And Coding
a.	Apply stacks, queues and recursion	Stacks, Queues and Recursion: Fundamentals, Different types of stacks and queues: Circular, dequeues etc.; evaluation of expressions, multiple stacks and queues;	Exercise	Practice And Coding
b.	Differentiate between stacks and queues			
c.	Evaluate expressions using stacks			

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
d.	Analyze recursive functions	Recursion: Direct and indirect recursion, depth of recursion; Simulation of Recursion: Removal of Recursion; Towers of Hanoi.		
a.	Construct graphs and trees	Elements of Graphs and Trees: Graph Terminology, Paths and Circuits, Connectedness, Matrix Representation of Graph and Isomorphism of graphs. Trees, Rooted trees, Path Lengths in Rooted Trees.	Exercise	Practice And Coding
b.	Differentiate between graphs and trees			
a.	Construct linked lists	Linked Lists: Single linked lists, Linked stacks and queues, the storage pool, polynomial addition, equivalence relations, sparse matrices, doubly linked lists and dynamic storage management, generalized lists, garbage collection and compaction	Exercise	Practice And Coding
b.	Apply linked lists to stacks and queues			
c.	Analyze memory allocation			
a.	Construct and apply extended binary trees	Extended binary trees: 2-trees, internal and external path lengths, Huffman codes/algorithm; Threaded binary trees, binary tree representation of trees; Application of Trees: Set representation, decision trees, game trees; Counting binary trees	Exercise	Practice And Coding
a.	Apply sorting algorithms	Sorting: Searching, bubble sort, shell sort, insertion sort, selection sort, quick sort, heap sort, 2-way merge sort, sorting on several keys, practical considerations of internal sorting. searching, hash techniques	Exercise	Practice And Coding
b.	Distinguish among sorting algorithms			
b.	Analyze sorting algorithms			

Recommended Books And Periodicals		
	Authors	Book Name
1.	S. Lipschutz	Theory and Problem of Data Structures
2.	E. Horowitz	Data Structure”
3.	D. E. Knuth	The Art of Computer Programming, Vol. 1, Fundamental Algorithms
4.	D. E. Knuth	The Art of Computer Programming, Vol. 2, Semi-numerical Algorithms
5.	D. E. Knuth	The Art of Computer Programming, Vol. 3, Sorting and Searching

Course No:	12	Course Title:	Digital Logic Design
Course Code:	CSE 1203	Pre-Requisites:	Nil
Credit:	3.00	Total Marks:	100
Contact Hours:	3 Hours/Week		
Mark Distribution:			
Semester Final Exam:	72 Marks	Class Test:	20 Marks
		Class Attendance:	08 Marks

11.1 Rationale:

A computer engineer needs to know about number system, logic design and the basic building blocks used in digital systems, in particular digital computers.

11.2 Objectives:

1. To learn about basic concept on number system, universal gates and truth tables.
2. To know about Boolean function and De-Morgan, canonical forms and minimization techniques
3. To learn about combinational and sequential circuits and basic flip flops
4. To know about synchronous and asynchronous counters

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a)	Explain number systems	Number systems and codes.	Lecture	Short Question
a)	Apply De-Morgan law for the Boolean function	Digital logic: Boolean algebra, De-Morgan's law, Logic gates and their truth tables.	Lecture Exercise	Spot Test Short Question
b)	State and explain De-Morgan			
a)	Evaluate canonical forms	Canonical forms, combinational logic circuits, minimization techniques.	Lecture Exercise Assignment	Spot Test Quiz Short Question Assignment
b)	Apply minimization techniques			
c)	Explain combinational logic circuits			
a)	Determine decoder and encoder function	Arithmetic and data handling logic circuit, decoders and encoders, Multiplexers and De-multiplexers.	Lecture Exercise Assignment	Spot Test Quiz Short Question
b)	Differentiate MUX and DEMUX			
c)	Draw data handling logic circuit			
a)	Explain flip flops and race problems	Combinational Circuit design, Flip-flops, race around problems.	Lecture Exercise Assignment	Spot Test Quiz Short Question
a)	Design synchronous and asynchronous circuits	Counters: Asynchronous and Synchronous counters and their applications.	Lecture Exercise Assignment	Spot Test Quiz Short Question Assignment
a)	Apply state diagram for logic circuits	Synchronous and asynchronous logic design: state diagram, Mealy and Moore machine.	Lecture Exercise Assignment	Spot Test Quiz Short Question
b)	State and explain Mealy and Moore machine			

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a)	Explain state minimization and assignments	State minimization and assignments. Pulse mode logic, Fundamental mode logic design.	Lecture Exercise Assignment	Spot Test Quiz Short Question Assignment
b)	Demonstrate pulse mode logic and mode logic design			

Recommended Books And Periodicals		
Authors	Book Name	
1. M. Morris Mano	Digital logic and Computer Design	
2. Tocci	Digital System Analysis	

Course No:	13	Course Title:	Digital Logic Design Lab
Course Code:	CSE-1204	Pre-Requisites:	Nil
Credit:	1.50	Total Marks:	100
Contact Hours:	3 Hours/Week		
Mark Distribution:			
	Lab Final Exam:	60 Marks	Viva: 30 Marks Class Attendance: 10 Marks

11.1 Rationale:

As a Computer engineer, one needs to apply logic gates and flip-flop in adder, subtractor, encoder, decoder and memory unit.

11.2 Objectives:

- To familiarize with different logic gates and flip-flops.
- To design combinational and sequential circuits using gate and flip-flops.

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a.	Identify and demonstrate logic gates.	Familiarization with different logic gates and flip-flops.	Lecture, Demonstration	Short Answer, Assignment, Viva, Reports
b.	Identify and demonstrate flip-flops.			
a.	Design and analysis different combinational circuits.	Half adder, Full adder, Half Subtractor, Full subtractor, Decoder, Encoder, MUX, DEMUX,	Lecture, Demonstration, Group Discussion	Short Answer, Assignment, Viva, Reports
a.	Design and analysis of different sequential circuits.	Flip-flops, Sequential circuit, Counter, Combinational Circuit.	Lecture, Demonstration, Group Discussion	Short Answer, Assignment, Viva, Reports

Recommended Books And Periodicals		
Authors	Book Name	
1. V.K. Mehta	Principles of Electronic	
2. R.L. Boylestad	Electronic Devices and Circuit Theory	
3. Millman&Halkias	Data Communication	

Course No:	14	Course Title:	Engineering Drawing
Course Code:	CSE-1206	Pre-Requisites:	Nil
Credit:	1.00	Total Marks:	100
Contact Hours:	2 Hours/Week		
Mark Distribution:			
	Lab Final Exam:	60 Marks	Viva: 30 Marks
			Class Attendance: 10 Marks

11.1 Rationale:

Capability of computer aided design and drawing is essential for an engineer in order to be able to design objects using some drawing software.

11.2 Objectives:

1. Understand scaling of drawing different objects.
2. Recognize objects from different views.
3. Design structures using drawing software

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a.	Apply scales	Familiarization with different logic gates and flip-flops.	Lecture, Demonstration	Practical Exam, Assignment, Viva, Reports
b.	Identify views			
a.	Find out missing lines.	Missing line, Auxiliary view, Detail and assembly drawing.	Lecture, Demonstration	Practical Exam, Assignment, Viva, Reports
b.	Apply auxiliary view and assembly drawing			
a.	Design objects using CAD.	Flip-flops, Sequential circuit, Counter, Combinational Circuit.	Lecture, Demonstration	Practical Exam, Assignment, Viva, Reports

Recommended Books And Periodicals		
	Authors	Book Name
1.	Wiley	Mastering AutoCAD 2008 and AutoCAD LT 2008
2.	M. Groover and E. Zimmers	Computer Aided Design and manufacturing
3.	S. Narayanan	CAD/CAM Robotics and Factories of the Future
4.	TienChien Chang	Computer Aided Manufacturing
5.		www.blender.org

Course No: 15	Course Title: Electronic Devices and Circuits
Course Code: EEE 1201	Pre-Requisites: EEE 1101
Credit: 3.00	Total Marks: 100
Contact Hours: 3 Hours/Week	
Mark Distribution:	
Semester Final Exam: 72 Marks	Class Test: 20 Marks Class Attendance: 08 Marks

11.1 Rationale:

Computer engineers need to learnthe concepts, characteristics and working principles of basic electronic devices and their applications in electronic circuits.

11.2 Objectives:

1. To learn basic concepts about semiconductor physics.
2. To know about formation of semiconductor diodes, transistors, field effect transistors, Oscillators and their working principle.
3. To know about power electronics devices and its operation.

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a.	Define and discuss semiconductor physics and semiconductors.	Theory of Semiconductors: Electronic structure of the elements, crystalline and amorphous solids, different types of crystal, band theory of solids, structure of silicon and germanium. Intrinsic and Extrinsic Semiconductors: N and P type semiconductor, carrier densities, generation and recombination of excess carriers, carrier life time, continuity equation.	Lecture, Reading, Assignment, Brainstroming	Short Answer, Essay, Assignment
a.	Define and explain semiconductor diodes.	Diode circuits: The PN junction, biasing and V-I characteristics of diodes, rectifier concept, half wave and full wave rectifiers, Zener diode and voltage regulators.	Lecture, Exercise, Assignment	Short Answer, Essay, Assignment, Exercise
b.	Derive equations for diode circuits.			
c.	Draw and describe diode clipping and clamping circuits.			
d.	Define and explain Zener diode.			
a.	Define and discuss Transistor.	Bipolar transistor: Junction transistors, principles of operation, biasing, characteristics in different configurations (CE, CB & CC), DC and AC load line, transistor equivalent circuits. Gain and impedance, Analysis of small signal low frequency transistor amplifier by using h-parameters.	Lecture, Reading, Assignment	Short Answer, Essay, Assignment, Exercise
b.	Classify Transistor circuits.			
c.	Describe different transistor circuits.			
d.	Describe different transistor models.			
e.	Explain frequency response of different transistor circuits.			

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
f.	Design and solve different transistors circuits.			
a.	Define and explain Field Effect Transistors.	Field effect transistor: Construction of JFET, its parameters, biasing, characteristics and principles of operation, different types of MOSFET and its operation and characteristics.	Lecture, Reading, Assignment	Short Answer, Essay, Assignment, Exercise
b.	Classify Field Effect Transistors.			
c.	Draw and Describe different FET circuits.			
d.	Design and solve different FET circuits.			
a.	Define and explain Amplifiers.	Amplifier: Voltage and current amplifiers of different configurations, RC coupled amplifier, operational amplifiers (OPAMPS), linear applications of OPAMPS, gain, input and output impedance.	Lecture, Reading, Assignment	Short Answer, Essay, Assignment
b.	Design and explain Amplifiers circuits.			
c.	Define and explain Operational Amplifiers.			
d.	Describe frequency response of OPAMP circuits.			
a.	Define and explain Oscillators.	Capacitor and Capacitance: Capacitance, Parallel plate capacitor, cylindrical capacitor, spherical capacitor, capacitors in series & parallel, energy stored in a capacitor, transformers.	Lecture, Reading, Assignment	Short Answer, Essay, Assignment, Exercise
b.	Classify Oscillators.			
c.	Classify power electronics devices.			
d.	Explain characteristics of power electronics devices.			
e.	Solve Oscillatory circuits.			

Recommended Books And Periodicals		
Authors		Book Name
1.	B. L. Theraja	Basic Electronics (Solid State).
2.	Boylestad and Nashelsky	Electronic Devices and Circuit Theory.
3.	Gupta and Kumar	Hand Book of Electronics.
4.	Millman and Helkias	Electronic Devices and Circuits.

Course No: 16	Course Title: Electronic Devices and Circuits Lab
Course Code: EEE 1202	Pre-Requisites: EEE 1102
Credit: 1.50	Total Marks: 100
Contact Hours: 3 Hours/Week	
Mark Distribution:	
Lab Final Exam: 60 Marks	Viva: 30 Marks Class Attendance: 10 Marks

11.1 Rationale:

Computer engineer needs to apply basics of electronics in electronic applications.

11.2 Objectives:

1. To familiarize with different electronic components and measuring instruments.
2. To design and performance analysis of different electronic circuits.

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a.	Identify electronic components.	Familiarization with different electronic devices and measuring instruments.	Lecture, Demonstration	Assignment, Practical Exam, Viva, Reports
b.	Demonstration of measuring instruments.			
Design and analyze performance of electronic circuits.		Diode, Transistor, UJT, SCR, DIAC, TRAIC, Zener diode, LED	Lecture, Exercise, Assignment	Assignment, Practical Exam, Viva, Reports

Recommended Books And Periodicals

Authors	Book Name
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|----|-------------------------|--|
| 1. | B. L. Theraja | Basic Electronics (Solid State). |
| 2. | Boylestad and Nashelsky | Electronic Devices and Circuit Theory. |
| 3. | Gupta and Kumar | Hand Book of Electronics. |
| 4. | Millman and Helkias | Electronic Devices and Circuits. |

Course No:	17	Course Title:	Differential Calculus and Differential Equations
Course Code:	MATH-1201	Pre-Requisites:	Nil
Credit:	3.00	Total Marks:	100
Contact Hours:	3 Hours/Week		
<u>Mark Distribution:</u>			
Semester Final Exam:	72 Marks	Class Test:	20 Marks
		Class Attendance:	08 Marks

11.1

Rationale:

To be a computer Engineer one has to have sound knowledge about techniques of differential calculus, differential equations and sequence and infinite series

11.2

Objectives:

1. To gain knowledge about Methods of Integration
2. Learn a collection of methods and techniques used to find solutions to several types of differential equations
3. To gain knowledge about Series.

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
1.	Find indefinite and definite integrals using integration by parts	Techniques of Integration: Integration by Parts, Trigonometric Substitution, Partial Fractions, Computer Algebra Systems (e.g., Mathematica, Sage), Approximate Integration - Simpson's Rule, Improper Integrals.	Lecture Exercise	Assignment Essay Exercise Short Answer
2.	Find indefinite and definite integrals using trigonometric substitution			
3.	Find indefinite and definite integrals of partial fractions			
4.	Learn about Computer Algebra Systems, Simpson's Rule, and Improper Integrals.			
1.	Find the length of an arc using integrals	Application of Integration: Arc Length, Area of a Surface of Revolution.	Lecture Exercise	Assignment Essay Exercise Short Answer
2.	Find the area of a Surface of Revolution			
1.	Solving First Order Differential Equations	Differential Equations: Modeling with Differential Equations, Solving First Order Differential Equations, Direction Fields and Euler's Method, Methods for Separable Equations and Linear Equations.	Lecture Exercise	Assignment Essay Exercise Short Answer
2.	Know about direction fields and Euler's Method			

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
3.	Learn Methods for Separable Equations and Linear Equations			
1.	Learn about the Curves defined by Parametric Equations and Calculus with Parametric Curves	Parametric Equations and Polar Coordinates: Curves Defined by Parametric Equations, Calculus with Parametric Curves, Polar Coordinates, Area and Length in Polar Coordinates, Conic Sections in Polar Coordinates.	Lecture Exercise	Assignment Essay Exercise Short Answer
2.	Learn the Polar Coordinates			
1.	Learn the Convergence of Sequences	Sequence and Infinite Series: Sequence and Convergence of Sequences, Infinite Series and Its Convergence, Convergence Tests, Alternating Series, Power Series and Its Convergence, Representing Functions as Power Series, Taylor and McClaurin Series, Applications of Taylor Polynomials, Approximating Functions by Polynomials.	Lecture Exercise	Assignment Essay Exercise Short Answer
2.	Learn the Infinite Series and its Convergence			
3.	Learn about Alternating Series, Power Series and Its Convergence			
4.	Know the applications of Taylor Polynomials and Approximating Functions by Polynomials.			

Recommended Books And Periodicals		
	Authors	Book Name
1.	S.P. Gordon	Calculus and the Computer.
2.	Dr. Konrad Knopp	Infinite Sequences and Series
3.	J.F. Hurley	Calculus
4.	Willard, Stephen	Calculus and its Application
5.	J. Stewart	Calculus.

Course No:	18	Course Title:	Physics for Computer Engineers		
Course Code:	PHY-1201	Pre-Requisites:	Nil		
Credit:	2.00	Total Marks:	100		
Contact Hours:	2 Hours/Week				
<u>Mark Distribution:</u>					
Semester Final Exam:	72 Marks	Class Test:	20 Marks	Class Attendance:	08 Marks

11.1 Rationale:

Someone wants to develop his/her career as a computer engineer needs to know the basic theories and principles of physics to generate problem solving, analytical, mathematical and solution finding skills; this course will equip him/her with the concepts of Kinetic Theory of Gases, Heat and Thermodynamics, Simple Harmonic Motion, Wave Motion, Sound Waves, Acoustics and Electrostatics.

11.2 Objectives:

1. Apply the concepts, ideas and methods of Physics required to solve problems in engineering studies.
2. Acquire knowledge about different laws and models of Physics, which will develop analytical capabilities among them.
3. Apply the laws and skills in higher studies or research areas.
4. Understand the origins in thermodynamics, electronics and Acoustics.
5. Explain everyday things happening around us.

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
a.	Deduce gas law	Kinetic theory of gases: Deduction of gas law, Principle of equipartition of energy, Equation of state – Andrew’s Experiment, Vander Waals equation, Critical Constants, Transmission of heat – conduction, convection and radiation.	Lecture	Short Answer Essay Practical Exam
b.	Describe equipartition of energy			
c.	Define critical constants			
d.	Differentiate among different types of transmission of heat			
a.	Demonstrate 1 st and 2 nd law of Thermodynamics	Heat and Thermodynamics: 1 st law of Thermodynamics, Internal energy, Specific heats of gases, Work done by expanding gas, Elasticity of a perfect gas, 2 nd law of thermodynamics, Carnot’s cycle, Efficiency of heat engines, Absolute scale of temperature, Entropy and its physical concepts, Maxwell’s thermodynamic relations, Statistical Mechanics	Lecture, Exercise	Short Answer Essay Practical Exam
b.	Explain work done by expanding gas			
c.	Apply Carnot’s cycle to find out engine efficiency			
d.	Analyze/ Prove Maxwell’s thermodynamic relation			
a.	Describe Simple Harmonic Motion	Simple Harmonic Motion: Simple harmonic motion, Combination of S.H.M. and Lissajous figures, Damped Oscillations, Forced oscillations, Resonance, Vibrations of membranes and columns.	Lecture Assignment Exercise	Short Answer Drawing Practical Exam
b.	Draw the mismatch between Damped Oscillation and Forced Oscillation			
c.	Define “Resonance”			
a.	Illustrate Superposition, Interference and diffraction of waves with figures	Wave motion: Travelling waves, Principle of superposition, wave velocity, Group velocity, Phase velocity, Power and intensity in wave motion, Interference, diffraction and transmission of waves, Standing Waves.	Lecture Demonstration Exercise	Short Answer Essay Practical Exam
b.	List the types of velocity play role in wave motion and interpret each with respective example			
c.	Describe an experiment forming standing wave on a string; compare between Nodes and Anti Nodes			
a.	Define and Categorize Ultrasonic, Audible, Infrasonic and Supersonic waves on the	Sound waves: Audible, Ultrasonic, Infrasonic and Supersonic waves, Propagation and speed of longitudinal	Lecture Demonstration Exercise	Short Answer Essay Practical Exam

11.3		11.4	11.5	11.6
Learning Outcomes		Course Content	Teaching Strategy/ Learning Experience	Assessment Strategy
	basis of frequency	waves, Travelling longitudinal waves, Standing longitudinal waves, Vibrating systems and sources of sound, Beats, The Doppler's effect		
b.	Analyze the formation of harmonics in case of standing longitudinal waves			
c.	State and explain Doppler's effect with example			
d.	Summarize how "Beats" are formed and explain the significance of "Beats" on musical notes?			
a.	Demonstrate Re-vibration	Acoustics: Re-vibration, Noise insulation and reduction, Compound absorption, sound distribution, Room acoustics, Recording.	Lecture Demonstration Assignment	Short Answer Essay
b.	Interpret necessity of noise insulation with practical life example.			
a.	State coulomb's law/ gauss's law.	Electrostatics Charge and matter, Coulomb's Law, The electric field, Gauss's Law, Electrical potential, Capacitance and Resistance, Ohmic and Non ohmic material, Variation of resistance with temperature.	Lecture Assignment	Short Answer Essay Practical Exam
b.	Differentiate between Ohmic and Non Ohmic material			
c.	Interpret the varying characteristic of resistance with temperature			

Recommended Books And Periodicals		
Authors	Book Name	
1. C. J. Adkins	Equilibrium Thermodynamics	
2. M. W. Zemansky	Heat and Thermodynamics	
3. Brijlal	Waves and Oscillation	
4. Puri	Waves and Vibrations	
5. Halliday and Resnick	Fundamentals of Physics	

Course No: 19	Course Title: Viva Voce
Course Code: CSE 1200	Pre-Requisites: Nil
Credit: 1.00	Total Marks: 100
Contact Hours: 1 Hour/Week	
Mark Distribution:	
Viva voce 100 Marks	