Department of Computer Science and Engineering
Khulna University of Engineering & Technology
Khulna - 9203, Bangladesh

Course Plan/Profile

1. **Course No.:** CSE 2201 **Contact Hours: 3**
2. **Course Title:** Algorithm Analysis and Design
3. **Course Teacher:** Mehnuma Tabassum Omar, Md. Shamimur Rahman
4. **Course Content:**

Analysis of algorithms: Time and space complexity analysis, correctness and loop invariants; Algebraic simplification and transformations; Lower bound theory; NP-completeness; NP-hard and NP-complete problems;

Algorithmic Techniques: Divide-and-conquer, greedy method, dynamic programming, backtracking, branch and bound; Flow algorithms; Approximation Algorithms; Introduction to parallel and randomized algorithms.

Search and Traversal Techniques: Basic search and traversal techniques; Topological sorting; Connected components; Spanning trees; Shortest paths;

5. **Reference:**
    a. **Introduction to Algorithms** – *Thomas H. Cormen, Charles E. Leiserson*
    b. **Computer Algorithms** – *Sartaj Sahni, Ellis Horowitz*
6. **Learning Outcome:**

- ✓ Identify some contributors to algorithms and relate their achievements to the knowledge area
- ✓ Use big O, omega, and theta notation to give asymptotic upper, lower, and tight bounds on time and space complexity of algorithms.
- ✓ Determine the time complexity of simple algorithms.
- ✓ Describe how computer engineering uses or benefits from algorithms.
- ✓ Deduce the recurrence relations that describe the time complexity of recursively-defined algorithms, and solve simple recurrence relations.
- ✓ Design algorithms using the brute-force, greedy, and divide-and-conquer strategies
- ✓ Solve problems using efficient sorting algorithms, and fundamental graph algorithms, including depth-first and breadth-first search, single-source and all-pairs shortest paths, transitive closure, topological sort, and at least one minimum spanning tree algorithm.
- ✓ Explain the significance of NP-completeness.
- ✓ Prove that a problem is NP-complete by reducing a classic known NP-complete problem to it.

7. Class Schedule:

Sl. No.	Week	Class	Topics to be Discussed	Text & Reference Book
1.	Week 1	Class 1	**An introduction to Algorithm:**	Web.
2.	Week 1	Class 2	**Breadth First Search & Depth First Search:** Examples	Cormen
3.	Week 1	Class 3	**Topological sort & Connected Components:** Examples	Cormen
4.	Week 2	Class 4	**Time Complexity:** definition of Time Complexity, necessity of Time Complexity, matrices of Time Complexity, calculate Time Complexity, mathematical representation of Time Complexity.	Ref.
5.	Week 2	Class 5	**Spanning Tress**: Kruskal & Prims	Cormen
6.	Week 2	Class 6	**Shortest path:** Dijkstra's Algorithm	Cormen
7.	Week 3	Class 7	**Space Complexity:** definition Space Complexity, necessity of Space Complexity, matrices of Space Complexity, calculate Space Complexity, mathematical representation of Space Complexity.	Ref
8.	Week 3	Class 8	**Shortest path:** Bellman-Ford Algorithm	Cormen
9.	Week 3	Class 9	**Shortest path:** Floyd-Warshall Algorithm	Cormen
10.	Week 4	Class 10	**Asymptotic Notation:** necessity of asymptotic notation, typical complexity functions, calculate Big-O notation	Ref.
11.	Week 4	Class 11	**Shortest path:** Johnson's Algorithm	Cormen
12.	Week 4	Class 12	**Flow Algorithms:** Ford-Fulkerson algorithm	Cormen
13.	Week 5	Class 13	**Asymptotic Notation:** Examples of Big-O notation, calculate Big-omega notation and Big-theta notation	Ref.
14.	Week 5	Class 14	**Flow Algorithms:** Edmonds-Karp algorithm	Cormen
15.	Week 5	Class 15	**Flow Algorithms:** Maximum Bipartite Matching	Cormen
16.	Week 6	Class 16	**Asymptotic Notation:** Examples of Big-omega notation and Big-theta notation	Ref.
17.	Week 6	Class 17	**Flow Algorithms:** Push-relabel & Relabel-to-front algorithm	Cormen
18.	Week 6	Class 18	**Scheduling**: Independent Task & **Bin Packing**	Sahni
19.	Week 7	Class 19	**Basic Traversal and Search Technique:** examples	Ref.
20.	Week 7	Class 20	**Divide and Conquer Method**: examples	
21.	Week 7	Class 21	**The Vertex-cover problem:** Examples	Cormen
22.	Week 8	Class 22	**Greedy Method:** definition, objective function, advantages and disadvantages, examples	Ref.

23.	Week 8	Class 23	**Greedy Method:** examples	Ref.
24.	Week 8	Class 24	**Lower Bound Theory:** Definition, Specification	Sahni
25.	Week 9	Class 25	**Dynamic Programming:** definition, objective function, advantages and disadvantages, examples	Ref.
26.	Week 9	Class 26	**Dynamic Programming:** examples	
27.	Week 9	Class 27	**Lower Bound Theory:** Exampels	Ref. Sahni
28.	Week 10	Class 28	**Dynamic Programming:** examples	Ref.
29.	Week 10	Class 29	**Backtracking:** definition, objective function, advantages and disadvantages, examples	Ref.
30.	Week 10	Class 30	**NP-completeness:** Definition, examples	Cormen
31.	Week 11	Class 31	**Backtracking:** examples	Ref.
32.	Week 11	Class 32	**Approximation Algorithm:** definition, objective function, advantages and disadvantages, examples	Ref.
33.	Week 11	Class 33	**Hamiltonian cycle & Subset-sum problem**	Cormen
34.	Week 12	Class 34	**Approximation Algorithm:**: Classification by backpropagation, Backpropagation and interpretability	Ref.
35.	Week 12	Class 35	**Parallel and Randomized Algorithm:** definition, objective function, advantages and disadvantages, examples	Ref.
36.	Week 12	Class 36	**Scheduling**: Flow shop Scheduling, Job Shop Scheduling & Scheduling identical processor	Cormen
37.	Week 13	Class 37	**Parallel and Randomized Algorithm:** examples	Ref.
38.	Week 13	Class 38	**Combinatorial Algorithm:** definition, objective function, advantages and disadvantages, examples	Ref.
39.	Week 13	Class 39	**AND/OR Graph** & **Node cover decision problem:** Exampels	Cormen

8. **Date of Class Test: 05 October 2018, 10 Oct 2018, COMBINED CT DATE**
9. **Signature of the Course Teacher:**

Department of Computer Science and Engineering
Khulna University of Engineering & Technology
Khulna - 9203, Bangladesh

Course Plan/Profile

1. **Course No.:**CSE 2202 **Contact Hours: 1.5**
2. **Course Title:**Algorithm Analysis and Design Laboratory
3. **Course Teacher:** MehnumaTabassum Omar, Prottoy Saha
4. **Course Content:**

Analysis of algorithms: Time and space complexity analysis, correctness and loop invariants; Algebraic simplification and transformations; Lower bound theory; NP-completeness; NP-hard and NP-complete problems;

Algorithmic Techniques: Divide-and-conquer, greedy method, dynamic programming, backtracking, branch and bound; Flow algorithms; Approximation Algorithms; Introduction to parallel and randomized algorithms.

Search and Traversal Techniques: Basic search and traversal techniques; Topological sorting; Connected components; Spanning trees; Shortest paths;

5. **Learning Outcome:**

- ✓ Identify some contributors to algorithms and relate their achievements to the knowledge area.
- ✓ Determine the complexities of algorithms.
- ✓ Argue the correctness of algorithms using inductive proofs and invariants and relate them practically.
- ✓ Describe different algorithm paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize algorithms, and analyze them.
- ✓ Explain what competitive analysis is and to which situations it applies. Perform competitive analysis.
- ✓ Compare between different data structures. Pick an appropriate data structure for a design situation.
- ✓ Describe how computer engineering uses or benefits from algorithms.

6. Class Schedule:

Sl. No.	Week	Class	Topics to be Discussed
1.	Week 1	Class 1	**Basic Search and Traversal Technique:** BFS and DFS
2.	Week 2	Class 2	**Divide Conquer Strategy**
3.	Week 3	Class 4	**Backtracking**
4.	Week 4	Class 2	**Greedy Method:** Minimum Spanning Tree (Krushkal and Prims)
5.	Week 5	Class 3	**Single Source Shortest Path:** Dijkstera
6.	Week 6	Class 4	**Single Source Shortest Path:** Bellman-ford
7.	Week 7	Class 5	**All Pair Shortest Path:** Floyd warshall
8.	Week 8	Class 6	**Backtracking and Greedy Method:**Fractional Knapsack
9.	Week 9	Class 7	**Labtest 01**
10.	Week 10	Class 8	**Dynamic Programming:** 0/1 Knapsack
11.	Week 11	Class 9	**Dynamic Programming:** Longest Common Subsequence
12.	Week 12	Class 10	**Combinatorial Algorithm:** Optimal Binary Search Tree
13.	Week 13	Class 11	**Ford–Fulkerson Algorithm:** Max Flow
14.	Week 14	Class 12	**Quiz**
15.	Week 15	Class 13	**Labtest 02**

7. Signature of the Course Teachers:

Department of Computer Science and Engineering
Khulna University of Engineering & Technology
Khulna - 9203, Bangladesh

Course Plan/Profile

1. Course No.:CSE 2203 Contact Hours: 3L+0T+0P Hrs/Week
2. Course Title: Microprocessors and Microcontrollers
3. Course Teacher: Mohammad Insanur Rahman Shuvo, Mr. Sunanda Das
4. **Course Content:**
   - **Introduction:** Microprocessors, microcomputers and microcontrollers, different types of microprocessors and its applications.
   - **Microprocessors:** 8086 Internal Architecture, Processor status and Flag registers, Machine and assembly language programming: Instruction Format, Instruction Sets, Opcode, Addressing modes, Branching and Looping; Traps and Interrupts, I/O operation, Interrupt Controller; An overview of Intel 80186, 80286, 80386 and Pentium Processors; RISC processors; Parallelism in Microprocessor; Bit-slice processor;
   - **Co-processors and DMA:** Arithmetic Co-processor; I/O processor; Programmable timer; DMA Data Transfer, DMA Controller;
   - **Microcontrollers:** Introduction to micro-controllers, Overview/review of Microcontroller Architecture, Data Representation and Memory Usage, Microcontroller Programming; Microcontroller Based System Design: Hardware design, Building, Debugging, Testing and Linking program modules, Hardware implementation and I/O support, Analysis of application examples: recursion and stack usage, and traffic light controller, Input / Output Architecture; Analysis of timing and memory requirements, Real time operation.
5. **Learning Outcome:**

The students will be acquainted with the fundamentals of microprocessors and microcontrollers. They will understand the basics of modern micro-processor's system architectures; as well as the organization and design principles behind modern microprocessor-based systems. Students should be able to demonstrate proficiency using internal registers, the stack, the program counter, various addressing modes and data transfer techniques of microprocessors /microcontrollers. They will be able to incorporate these concepts into their electronic designs where control can be achieved via a microprocessor/microcontroller implementation.

6. RECOMMENDED TEXT BOOKS:

Sl. No	Title	Author(s)	Assigned code
01.	Microprocessors and Interfacing: Programming and Hardware	Douglas V. Hall	Hall
02.	The Intel Microprocessor Architecture, Programming and Interfacing	Barry B. Brey	Barry
03.	Microprocessors: Principles and Applications	Ajit Pal	Pal
04.	Advance Microprocessors and Interfacing	Badri Ram	Ram
05.	The 8051 Microcontroller: Architecture, Programming and Application	Kenneth j. Ayala	Ayala
06.	The 8051 Microcontroller and Embedded Systems: Using Assembly and C	Muhammad Ali Mazidi Janice Gillispie Mazidi Rolin D. McKinlay	Mazidi
07.	The 8051 Microcontroller	I. Scott MacKenzie	Scott
08	Microcomputer Systems: The 8086/8088 Family	Yu-Cheng Liu, Glenn A. Gibson	Gibson

7. Class Schedule: IRS = Mohammad Insanur Rahman Shuvo , SD = Mr Sunanda Das

Sl. No.	Week	Class	Topics to be Discussed	Text & Reference Book
01.	1st	01.	**SD:** Introduction: Microprocessors, Microcomputers, and microcontrollers, Different types of microprocessors and its applications	Ayala, Hall
02.		02.	**SD:** Microprocessors: 8086 Internal Architecture	Hall
03.		03.	**IRS**: Introduction to Microprocessor and Microcontroller	Ayala, Hall
04.	2nd	01.	**SD:** Microprocessors: 8086 Internal Architecture	Hall

05.		02.	**SD:** Processor status and Flag registers	Hall, Ram
06.		03.	**IRS:** Introduction to Microprocessor and Microcontroller	Ayala, Hall
07.	3rd	01.	**SD:** Machine and assembly language programming	Hall, Gibson, Ram
08.		02.	**SD:** Machine and assembly language programming	Hall, Gibson, Ram
09.		03.	**IRS:** Coprocessor : Math Coprocessor (8087)	Hall
10.	4th	01.	**SD:** Machine and assembly language programming	Hall, Gibson, Ram
11.		02.	**SD:** Instruction Format, Instruction Sets	Hall
12.		03.	**IRS:** Coprocessor : Math Coprocessor (8087,80287,80387)	Hall, Ram
13.	5th	01.	**SD:** Instruction Format, Instruction Sets	Hall
14.		02.	**SD:** Opcode	Hall
15.		03.	**IRS:** I/O processor : UPI-452	Ram
16.	6th	01.	**SD:** Addressing modes	Hall
17.		02.	**SD:** Addressing modes	Hall
18.		03.	**IRS:** 8254 Software Programmable Timer	Hall
19.	7th	01.	**SD:** Branching and Looping	Hall
20.		02.	**SD:** Traps and Interrupts	Hall
21.		03.	**IRS:** 8254 Software Programmable Timer	Hall
22.	8th	01.	**SD:** I/O operation	Hall
23.		02.	**IRS:** DMA: Data transfer, controller	Hall, Pal
24.		03.	**IRS:** DMA: Data transfer, controller	Hall, Pal
25.	9th	01.	**SD:** Interrupt Controller	Hall
26.		02.	**IRS:** Overview of Microcontroller Architecture (8051)	Ayala
27.		03.	**IRS:** Data Representation and Memory Usage of 8051	Ayala
28.	10th	01.	**SD:** RISC processors	Pal
29.		02.	**IRS:** Microcontroller(8051) Timer and other operations	Ayala
30.		03.	**IRS:** Microcontroller(8051) Timer and other operations	Ayala
31.	11th	01.	**SD:** Parallelism in Microprocessor	• https://en.wikibooks.org/wiki/Microprocessor_Design/Memory-Level_Parallelism • https://www.slideshare.net/attrimahesh/1prallelism

32.		02.	**IRS:** Microcontroller Interrupt	Ayala
33.		03.	**IRS:** Microcontroller Programming using C	Mazidi
34.	12th	01.	**SD:** Bit-slice processor	Ram
35.		02.	**IRS:** Microcontroller Programming using C	Mazidi
36.		03.	**IRS:** Microcontroller Based System design (Traffic Light Controller)	Mazidi
37.	13th	01.	**SD:** Review Class	
38.		02.	**IRS:** Microcontroller Based System design (Digital Clock)	Mazidi
39.		03.	**IRS:** Microcontroller Based System design (Automatic Bidirectional counter)	Mazidi

8. Teaching Methodology/Strategy:

Lectures,
Laboratories,
Tutorials,
Assignments,
Class Tests, and
Examinations

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Course Plan/Profile

1. **Course No.:** CSE 2207 **Contact Hours:3**
2. **Course Title:** Numerical Methods
3. **Course Teacher:** Nazia Jahan Khan Chowdhury
4. **Course Content:**

Numbers and Errors:

Absolute and relative error, Rounding error, propagation of error in arithmetic process.

Single non linear equation:

Method of iteration, Bisection method, False position method, Secant method, Newton raphson method, Fixed point method.

Interpolation:

Curve fitting by least squares, Divided Difference tables, Newton forward interpolation formula with error, Lagranges interpolation formula.

Least Squares Approximation of Functions :

Linear and polynomial regression.

5. **Learning Outcome:**
    1. Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.
    2. Apply numerical methods to obtain approximate solutions to mathematical problems.
    3. Derive numerical methods for various mathematical operations and such as interpolation, differentiation, integration, the solution of linear and nonlinear equations.
    4. Analyze and evaluate the accuracy of common numerical methods.
6. **References:**
    I. "Numerical Methods " by E. Balagurusamy
    II. "Numerical Methods for Engineers " by Chapra Canale.

7. **Class Schedule:**

Sl. No.	Week	Class	Topics to be Discussed	Reference
1.	Week1	Class1	Introduction and Numerical Errors	Reference I (chapter 4, 4.4)
2.	Week 2	Class 2	Methods of finding roots and their solutions	Reference I (chapter 6, 6.1)

3.	Week 3	Class 3	Iteration Method (Bisection Method)	Reference I (chapter 6, 6.4,6.6)
4.	Week 4	Class 4	Iteration Method(False position)	Reference I (chapter 6, 6.7)
5.	Week 5	Class 5	Iteration Method (Newton Raphson)	Reference I (chapter 6, 6.8)
6.	Week 6	Class 6	Iteration Method(Limitation & Convergence of Newton raphson)	Reference I (chapter 6, 6.8)
7.	Week 7	Class 7	Iteration Method(Newton raphson continued)	Reference I (chapter 6, 6.8)
8.	Week 7	Class 8	Iteration Method (Secant Method)	Reference I (chapter 6, 6.9)
9.	Week 8	Class 9	Class test 1	
10.	Week 8	Class 10	Interpolation (Curve fitting)	Reference I (chapter 9, 9.1,9.2,9.3)
11.	Week 9	Class 11	Interpolation (Lagranges interpolation formula)	Reference I (chapter 9 , 9.4)
12.	Week 9	Class 12	Interpolation (Lagranges interpolation formula)	Reference I (chapter 9 , 9.4)
13.	Week 10	Class 13	Interpolation (Newton Interpolation Polynomial)	Reference I (chapter 9 , 9.4)
14.	Week 10	Class 14	Interpolation(Divided difference Table)	Reference I (chapter 9 , 9.6)
15.	Week 11	Class 15	Interpolation(Divided difference Table continued)	Reference I (chapter 9 , 9.6)
16.	Week 11	Class 16	Interpolation (Newton forward Difference formula)	Reference I (chapter 9 , 9.7)
17.	Week 12	Class 17	Class test 2 (combined)	
18.	Week 12	Class 18	Regression (Least Square)	Reference I (chapter 10 , 10.2)
19.	Week 13	Class 19	Regression (Polynomial)	Reference I (chapter 10 , 10.4)

8. Teaching Methodology/Strategy: Lectures, exercises , assignments

9. Signature of the Course Teacher:

Department of Computer Science and Engineering
Khulna University of Engineering & Technology
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Course Plan/Profile

1. Course No.:CSE 2208 Contact Hours: 6 hours/week
2. Course Title: Numerical Methods Laboratory
3. Course Teacher: Al-Mahmud and Abdus Salim Mollah
4. Learning Outcome:
    - Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions.
    - Apply numerical methods to obtain approximate solutions to mathematical problems.
    - Analyse and evaluate the accuracy of common numerical methods.
    - Implementation of various numerical methods.
5. Class Schedule:

Week	Lab	Topics to be Discussed	Text & Reference Book
1	1	Iterative Solution of Linear Equations	1. Numerical Methods -E. Balagurusamy 2. Numerical Methods for Engineers -Chapra, Canale
1	2	Iterative Solution of Linear Equations (continue)	
2	3	Iterative Solution of Linear Equations (continue)	
2	4	Iterative Solution of Linear Equations (continue)	
3	5	Solution of Ordinary Differential Equations	
3	6	Solution of Ordinary Differential Equations (continue)	
4	7	Solution of Ordinary Differential Equations (continue)	
4	8	Solution of Ordinary Differential Equations (continue)	
5	9	Numerical Integration	
5	10	Numerical Integration (continue)	
6	11	Numerical Differentiation	
6	12	Numerical Differentiation (continue)	
7	13	Finding Roots of Non-linear Equations	
7	14	Finding Roots of Non-linear Equations (continue)	
8	15	Finding Roots of Non-linear Equations (continue)	
8	16	Finding Roots of Non-linear Equations (continue)	
9	17	Interpolation	
9	18	Interpolation (continue)	
10	19	Interpolation (continue)	
10	20	Interpolation (continue)	

11	21	Regression	
11	22	Regression (Continued)	
12	23	Solution of Matrix Problems	
12	24	Solution of Matrix Problems (Continued)	
13	25	Lab Test	
13	26	Quiz	

6. Teaching Methodology/Strategy: Lectures, Exercises, Experiments and Assignments.
7. Signature of the Course Teacher:

Department of Computer Science and Engineering
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Bangladesh

Course Plan

1. Course No. : Hum- 2207
2. Course Title: Economics & Accounting
3. Course Contact Hours: 3.00 (Three) Credit Hours Per Week
4. Course Teacher/s: Shahrear Roman and Tania Haque

Objectives of the Course

Economics is not a collection of facts to be written down and memorized. Economics is a way of thinking about the world – and the world is always changing. Economists have developed a set of simple but widely applicable concepts and principles that are useful for understanding economic situations ranging from decisions that individuals make every day to decisions made by firms and governments in complex markets. The objective of this course is to help students learn and understand these concepts and principles and to apply them to a variety of economic situations.

Learning Outcome:

On successful completion of the course, students should be able to:
1. Maintain full and systematic recording of accounts.
2. Record financial transactions in a systematic way.
3. Estimate cost and prepare budget for the financial organization /company.
4. Do analysis of financial information.
5. Make decision about financial Matter.

Sl No.	Week	Class	Topic to be Discussed
1	Week 1	Class 1	Definition of Accounting, Need of Accounting for Engineers, Users of Accounting information.
		Class 2	Importance of Accounting, Generally Accepted Accounting Principles (GAAP), Relationship between Book–Keeping and Accounting.
2	Week 2	Class 1	Business Transactions, Rules of Debit and Credit, Double Entry System of Accounting.
		Class 2	
3	Week 3	Class 1	Accounting cycle-discussion, The Recording Process, Steps in Recording Process.
		Class 2	The Journal- theory discussion, problems and solution
4	Week 4	Class 1	The Journal- theory discussion, problems and solution
		Class 2	
5	Week 5	Class 1	The Ledger- theory discussion, problems and solution
		Class 2	The Ledger- theory discussion, problems and solution
6	Week 6	Class 1	The Trial Balance- theory discussion
		Class 2	
7	Week 7	Class 1	The Trial Balance- problems and solution
		Class 2	The Trial Balance- problems and solution
8	Week 8	Class 1	Cash Book- theory discussion, problems and solution
		Class 2	
9	Week 9	Class 1	The Financial Statements- theory discussion
		Class 2	The Financial Statements- problems and solution
10	Week 10	Class 1	The Financial Statements- problems and solution
		Class 2	
11	Week 11	Class 1	The Financial Statements- problems and solution
		Class 2	The Financial Statements- problems and solution

12	Week 12	Class 1	Cost Accounting-Concept of cost, Classification of cost.
		Class 2	
13	Week 13	Class 1	Statement of cost, Operating and Service costing, Salary and Wages/Payroll account.
		Class 2	Salary and Wages/Payroll account.

Text Book: Samuelson and Nordhaus: Economics

References Book/s: G. Mankiw: Principles of Economics

K. K. Dewett: Principles of Economics

Skylark Chadha: Managing Projects in Bangladesh

George Arvin: Modern Cost - Benefit Methods

Reference Book (1) Basic accounting: S.A Hasib and Kabir. Ideal Book Dhaka, Latest edition 2015

(2) Accounting Principles Weygand, Kieso and Kimmel. John willey and sons, 1ne New York.

(3) Cost Accounting Principles, Mart & Usry

Department of Computer Science and Engineering
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Course Plan/Profile

1. Course No.: **MATH 2207** Contact Hours: 45 m × 1.5/ Week
2. Course Title: Mathematics IV
3. Course Teacher: A. R. M. Jalal Uddin Jamali
4. Course Content: **Statistics:** Moment, Skewness, Kurtosis, Expectation, Probability Distribution **, Vector Analysis**: Differentiation of vectors, Gradient, Divergence and Curl of point function and related form,

5. Learning Outcome: On successful completion of the course, graduates should be able to:
   - ✓ Earn theoretical basic knowledge about analysis of statistical sample data
   - ✓ able to apply statistical method for analysis of sample data
   - ✓ Apply statistical tools for analysis of sample data
   - ✓ Earn theoretical basic knowledge about probability as well as some well known probability distributions
   - ✓ Able to apply the concept of the probability distributions basically some well-known distributions namely Binomial, Poisson and Normal distributions in physical applications.
   - ✓ Earn knowledge about differentiation of vectors
   - ✓ Earn knowledge about definitions and properties of vector operators namely gradient, divergence and Curl of vector point functions.
   - ✓ Apply these vectors differential operators in engineering field of applications.

6. Class Schedule:

Sl. No.	Week	Class	Topics to be Discussed	Text & Reference Book
01	01	1	Review of data analysis, frequency distribution, representation ,	1. Statistics-By M R Spiegel 2. Business Statistics – By Gupta & Gupta
02	01	2	Review of Central tendency, dispersion , Skewness, Kurtosis,	
03	01	3	Moments, moment coefficient of skewness and Kurtosis [assignment]	
04	02	4	Experiments, Random variable , probability	
05	03	5	Probability distribution , Expectation and its property	1. Probability and Statistics- M R Spiegel 2. Business Statistics – Gupta and Gupta

06	4	6	Bernoulli and Poisson process, binomial distribution	
07	4	7	Properties of Binomial distribution, and application	
08	5	8	Poisson distribution, properties and application	
09	**6**	**9**	**CT [Expectation to Poisson Distribution]**	
10	6	10	Continuous Probability distribution, Normal Distribution	
11	7	11	Properties of Normal distribution and its application	
12	8	12	Uniform Distribution and its properties	
13	8	13	Vector Differentiation and properties	Vector Analysis: By M R Speigel
14	9	14	Application Vector Differentiation	
15	10	15	Vector Operator: gradient and its properties	
16	10	16	Vector Operator: Divergence and its properties	
17	11	17	Vector Operator: Curl and its properties	
18	12	18	Application of gradient, Divergence, Curl	
19	13	19	Application of gradient, Divergence, Curl	

7. Date of Class Test: Tentative within (active) sixth week

   Note 1: One or more Spot tests will be held without any pre-declaration

   Note 2. One or more Assignments problems will be thrown to solve for each individual/group of students
8. Teaching Methodology/Strategy: White board, discussion

9. Signature of the Course Teacher: