			_	_				_	_								
	9	8	7	6	5	4	w	2	1	#1S	Year-2		10	9	8	7	6
-	MATH 2105	HUM 1201	CSTE 2107	CSTE 2106	CSTE 2105	CSTE 2104	CSTE 2103	CSTE 2102	CSTE 2101	Course Code	Year-2 Term-1		CSTE 1226	BMS 1201	MATH 1203	CSTE 1208	CSTE 1207
	Matrices, Vector Analysis and Co-ordinate Geometry	Industrial Management and Accountancy	Theory of Computation	Digital Logic Design Lab	Digital Logic Design	Algorithm Design and Analysis Lab	Algorithm Design and Analysis	Object Oriented Programming with C++ Lab	Object Oriented Programming with C++	Course Title		Total	Viva Voce	History of the Emergence of Independent Bangladesh	Ordinary and Partial Differential equations	Electronic Devices and Circuits Lab	Electronic Devices and Circuits
-	w	32	33	1	3	1.5	3	1.5	3	Credit		21.5	-		7	-	
1	ω	w	w	2	3	w	3	3	S	Hours		24	2	0	7	2	, w

Year-2 Term-2

23

Credit Hours

Course Code

Year-2 Term-1

26	22	Total		
0	C	Geometry	MATH 2105	9
2	2	Matrices, Vector Analysis and Co-ordinate	2010	
3	3	Industrial Management and Accountancy	HUM 1201	~
3	3	Theory of Computation	CSTE 2107	7
2 .	1	Digital Logic Design Lab	CSTE 2106	6
3	·	Digital Logic Design	CSTE 2105	5
3	1.5	Algorithm Design and Analysis Lab	CSTE 2104	4
		Algorithm Design and Analysis	CSTE 2103	3
3	1.5	Object Oriented Programming with C++ Lab	CSTE 2102	2
w		Object Oriented Programming with C++	CSTE 2101	-
Hours	Credit	Course Title	Course Code	SI.#

COURSE TITLE: OBJECT ORIENTED PROGRAMMING WITH C++

Course Code: CSTE 2101 Credit Hours: 03 Exam Hours: 04 Attendance: 05 CIE Marks: 25 SEE Marks: 70

Course Objectives:

Introduce th	Introduce the basic concent of Object-oriented Programming	nted Programn	ning	
	Discuss how to design, develop, and program using C++.	ram using C++	ä	
	Make familiar with OOP tools and implement OOP solution to the real-life problem in C++	nent OOP solut	tion to the real-life problem	in C++.
> Make f:	Make familiar with some advanced features of OOP	es of OOP.	The second second second	
Resources Use	Resources Used: Multimedia, Whiteboard, Marker, Handouts, pdf books, e-Tutorials.	er, Handouts, p	df books, e-Tutorials.	
Course	CLOs Description (At the en	d of the course	Description (At the end of the course, students will be able to)	
Learning	CLO1 explain the basic princ	ciples of object	explain the basic principles of object-oriented programming i.e. data abstraction,	e. data abstraction,
Outcomes	encapsulation, inheritance, and polymorphism.	ce, and polymo	orphism.	
(CLO)	CLO2 apply the concept of ar	n object and its	apply the concept of an object and its relationships in modeling & building object-	& building object-
	oriented solutions.			
	CLO3 analyze real-life scenari	os for finding t	analyze real-life scenarios for finding feasible object-oriented solutions	tions.
Mapping of	PLO1 PLO2 PLO3 PI	O4 PLO5 PL	PLO1 PLO2 PLO3 PLO4 PLO5 PLO6 PLO7 PLO8 PLO9 PLO10 PLO11 PLO12	O10 PLO11 PLO12
CLO to PLO	CLO1 V			
(Program	CLO2 V			
Outcome)	CLO3			
	Lesson	Lesson Plan (as per week):	week):	
	CourseContents	CLOs	Teaching Learning	Assessment Charles (How they
Week			Strategy (activities directed to achieve outcomes)	are developed)
1 Fundar Design:	Fundamentals of object-oriented Design:	CLO1	II it	Answer basic questions, quizzes,
Data Al Inherita Hierarc	Data Abstraction, Encapsulation, classes, Inheritance and Polymorphism, class Hierarchies. Designing and object-			exams.
orientec	oriented system; Identifying the classes,		Topic wise lecture delivery.	

12	=	10	9	∞	7	6	5	4	w	12	
	File processing: File processing – formatted – and random files. Microsoft t classes: Strings, data structur	Operator overloading: Overloading unary operator, overloading a binary operator, data conversion.	Virtual functions, abstract classes, polymorphism, classification of inheritance, classes within classes	8 Inheritance and polymorphism: Derived class and base class, derived class constructors, overriding member functions, public, protected and private inheritance.	7 'this' pointer, Static and Friend: "this" pointer, Static members, friends, array of class objects.				3 C++ enhancements to C: Default Function Arguments, Placement of variable declarations, the scope resolution operation, the "Const" Qualifier, overloaded functions.		Assigning Attributes and Behavior, finding relationship between classes, arranging classes into hierarchies: A design example.
on ential CLO2	cLO2 ounformatted coundation e.	cLO2 erloading on.		CP	ends,	tion. CLO1, CLO2 cation:	s on of	es and cLO1 crs,	ement CLO1	CL01	
Lecture on the characteristics of generic programming and	Lecture on file processing using IO stream. String processing and some basic data structure.	Lecture on operator overloading with problems solution.	CLO2, CLO3 Lecture on the types of inheritance and how to override methods in inheritance using virtual function and application of nested classes.	Lecture on basic of inheritance. Explain inheritance with real life example.	Lecture on this pointer, static variable and static functions, friend function, and friend class. Explain their use and necessity.	Lecture and discussion on dynamic memory allocation of objects.	Lecture and discussion on class and object. Accessing class members.		Lecture and discussion with problems solution.		
of the week's 9-11)	Homework, examples.	Answer basic questions, examples.	of the week's 5-8)	Answer basic questions, quizzes, examples.	Answer basic questions, examples.	Answer basic questions, quizzes, Homework (Memory Allocation).	of the week's 1-4)	(Reference), exams.	questions, exams.	concept and STL), exams.	

Create	Evaluate	Analyze	Apply	Oliderstand	Kemember		Bloom's Category	(Average of best 2 out of 3 will be counted)	CIE Continuous Interval Evolution (25)						Pearson Education			2. Object Ories	Cohon/ Jack	Recommended Books:	Interface and Exception Handling.	
			5	10	10		Test-1 (25)	t of 3 will be	erval Evoluti			omplete Refe	shed The con	ng with C++ b	ication.	Program. In:	nted Program	nted Program	Cohon/ Jack W. Davison.	ks: n Design- An	xception Han	nction nuance
			5	10	10		Test-2 (25)	counted)	ion (25)		ASS	erence by Her	nprehensive S	by Schaum's		troduction to	ming in Micr	ming in Micr		introduction	dling.	S.
			10	15			Assignment (25)			Attendance- 05	ASSESMENT PATTERN	C++- The Complete Reference by Herbert Schildt, INH.	C++- Unleashed The comprehensive Solutions by J. Liberty	Programming with C++ by Schaum's Outline Series		Object Oriento	osoft C++by E	osoft C++ by I	(to Programmi	CEO2, CEO	
	Create	Evaluate	Analyze	Apply	Understand	Remember	Bloom s Category	Di Catagory	SEE-Semester End Examination (70 marks)	05	TTERN	MH.	Liberty			C++ How to Program. Introduction to Object Oriented Design with the UML by Delteled Design wit	Object Oriented Programming in Microsoft C++by E. Balagurusamy, TMH.	Object Oriented Programming in Microsoft C++ by RoberLafore, Galgotia Book House		nended Books: C++ program Design- An introduction to Programming and Object-Oriented Design by James P.	the use of interface and how answering methods to handle exception using in final exam. some problems solution.	with some problem's solution.
			100	20	30	25		Test	nation (70 marks)							Dellela Delivi,	Daital & Deitel	House.		gn by James P.	in final exam.	

COURSE TITLE: OBJECT ORIENTED PROGRAMMING WITH C++ LAB Viva:

Resources Used: Multimedia, Whiteboard, Marker, Handouts, pdf books, e-Tutorials, Code Blocks IDE Course Objectives: Outcomes Learning Exam Hours: 03 Credit Hours: 1.5 Course Code: CSTE 2102 Course Perform experiments to verify practically the theories and concepts develop in CSTE 2101 Develop the students for designing object-oriented programs using C++. Make familiar with OOP tools and implement OOP solution to the real-life problem in C++. CLO2 CL01 CLOs explain object-oriented programs using OOP concepts. analyze real-world problems using an object-oriented programming language use object-oriented concepts in solving computational problems. Description (At the end of the course, students will be able to) SEE Marks: 70 Attendance: 10 20

(CLO)

CLO3

CLO4

carry out tasks in a team environment.

PLO1 PLO2 PLO3 PLO4 PLO5 PLO6 PLO7 PLO8 PLO9 PLO10 PLO11 PLO12

Outcome)

CLO4 CLO3 CLO to PLO Mapping of

CLO1

(Program

CLO2

2 2

2

Learning

			Pro Usi prol com diffe To p	11 Ad Pro Sta Cla	7-8 Pr	5-6 II	2 T S T 2 3 1	72	Week
A	ASSES	Final	Problem Solving Activities Using random access files for solving problems; Problems related to sharing common algorithms and procedures for different data type, Problems on ACM. To perform also other experiments relevant to this course, submit project.	Advance Topic Problems related to: Static, Pure Virtual Function, Abstract Class, Interface, Exception Handling and Template function.	Polymorphism Problems related to creation of Overloaded functions and constructor. Problems related to overloading relational and logical operators. Problems related to Method overriding. Test of achieving runtime polymorphism.	Inheritance Experiments related to Introducing Inheritance and verification; Inheriting classes and sharing base classes functions;	Encapsulation Problems related to creation of classes generating output. Writing member variable, member functions, constructor and destructor. Problems related to different access specifiers. Problems using array of objects, pointers and references;	A first look at C++ Performing various C++, I/Operations; Different input and output technique Using streams concept. String related problems. Standard Template Library (STL): vector, List, stack, queue, iterators.	CourseContents
Attendance- 10 Viva- 20	ASSESMENT PATTERN	Final Lab Exam (Lab and	CLO2, Practice CLO3, CLO4 problem.	CLO1, CLO2, CLO3	CLO1, Discussion CLO2, CLO3 case study	CLO1, CLO2 Discussion, case study			CLOs Str dir
0	TERN	ab and Viva)	Practice with a real-life problem.	CLO1, Discussion, Practice with a CLO2, CLO3 real-life problem.	Discussion, practice and case study	case study	case study	CLO CI O2 Discussion, practice and	Teaching Learning Strategy (activities directed to achieve outcomes) Discussion and practice
			Answer basic questions, Homework Quiz 3 (Topic of the 9-13 weeks)	Quiz 2 (Topic of the 5-8 weeks)	Homework, 4mzz	the 1-4 weeks)	ewoi		Strategy (How they are developed) -Home task



Create	Evaluate	Analyze	Apply	Understand	Remember	bloom's Category
		20	40	10		Test

COURSE TITLE: ALGORITHM DESIGN AND ANALYSIS

Review: Bas queue, BST, traversal, Ur interval tree.	- Desig 2 Growth - Asympath - Standa	I Introdu The role -What -Algor - Anal	Week		Learning Outcome)	CLO to PLO (Program	Mapping of	Course Learning Outcomes (CLO)	Course Objectives: > Introduce value valu	Course Code: CSTE Credit Hours: 03 Exam Hours: 04
Review: Basic data structure: stack, queue, BST, Heap, Priority queue, tree traversal, Union find, segment tree, interval tree.	- Designing algorithm Growth of functions - Asymptotic notation - Standard notation and	Introduction with algorithm: The role of algorithm in computing: -What is algorithm? -Algorithm as a technology - Analyzing algorithm	CourseContents		CLO3	CLO1 V	PLO1	CLOs Desci CLO1 under CLO2 execu CLO3 moni	ives: ce various data s the asymptotic the performanc d: Multimedia,	CSTE 2103 03 04
cture: stack, rity queue, tree gment tree,	- Designing algorithm Frowth of functions Asymptotic notation Standard notation and common function	rithm: computing: logy	itents	Lesso	2			Description (At the end of the course, students wi understand the concepts of different algorithms. execute and implement different types of algorithms monitor and compare the performance of different algorithms.	Objectives: Introduce various data structures and algorithms Discuss the asymptotic performance of different Explain the performance of different algorithms ces Used: Multimedia, Whiteboard, Marker, Har	
CLOI		CLO1	CLOs	Lesson Plan (as per week):			LO4 PLO5 PL	s of different alg different types of different types of the performance	orithms. ifferent searchin orithms with thei er, Handouts, Pl	
the complexity of the data structures, usefulness, and the basic differences between them. Discussion should be followed by some interesting problems on different data structure.	CLO1, CLO3 Lecture and discussion on the complexity of the algorithm, analysis and finding the complexity.			week):			PLO2 PLO3 PLO4 PLO5 PLO6 PLO7 PLU8 PLO9 PLO3 PLO10 I	understand the concepts of different algorithms. execute and implement different types of algorithms. monitor and compare the performance of different algorithms.	Course Objectives: Introduce various data structures and algorithms. Discuss the asymptotic performance of different searching, sorting, traversing, tree, and graph algorithms. Explain the performance of different algorithms with their feasibility for real-life scenarios. Resources Used: Multimedia, Whiteboard, Marker, Handouts, PDF books, Slides, e-Tutorials, PowerPoint.	
interesting questions on data structures. b. Solving some reallife problems.	Answer basic questions, quizzes.	question on complexity analysis and Solve some basic problems.	Strategy (How they are developed)	Assessment				Ma pr O11 pt O12	d graph algorithms. arios. PowerPoint.	Attendance: 05 CIE Marks: 25 SEE Marks: 70

12-13	10-11	9	7-8	0	4-5	
a. Problem solving paradigms: greedy, divide and conquer, dynamic programming , recursive memorization, 2 pointer idea, complete search, using binary search and	Graph Algorithms: BFS, DFS, Advance dfs, Exhaustive bfs, MST, Shortest path algorithms, detecting negative cycles, DAG.	Greedy Algorithm - How greedy algorithm differs from dynamic programming - Elements of the greedy strategy	Dynamic Programming - What is dynamic programming? - How it works? - Elements of dynamic programming - Example Analysis (Rod cutting problem, Matrix chain multiplication, Longest Common Subsequence)	- Analysis of quicksort Search Paradigms: a. Linear Search -Description of linear search -Performance of linear search -Analysis of linear search -Description of binary search -Description of binary search -Performance of binary search	Sorting Paradigms: a. Divide and conquer approach a. Divide and conquer - What is divide and conquer approach? approach? approach? b. Heapsort - Heaps - Maintaining the heap property - Building a heap - The heap sort algorithm c. Quicksort - Description of quicksort - Performance of quicksort	
CLO2, CLO3 a.	CL01, CL02, CL03.	CL01, CL02, CL03.	CL02, CL03.		CLO3	1
a. Practice with UVA online.b. Can participate online programming contest.	 a. General techniques will Class Test 3 (topics be taught in the lecture. of the week's 8-11) b. Exercises will be given in the tutorial and the lecturer. c. Assignments will be given to the students. 	vill	ne ne	and discussion blems. with example with example. al life example.		Lecture and discussion
Problem solving.	Class Test 3 (topics of the week's 8-11)	Answer basic questions, quizzes, Homework	of the week's 5-1)	assignment, make assignment make problem one group and another group will find its solution, quizzes. Class Test 2 (topics	Discussion, give	of the week's 1-4)

30 20					0
30	Evaluate				Evaluate
30	Analyze	10	5	5	Analyze
	Apply	10	10	10	Apply
20	Understand	5	10	10	Understand
	Remember				Remember
Test	Bloom's Category	Assignment (25)	Test-2 (25)	Test-1 (25)	Bloom's Category
nation (70 marks)	SEE-Semester End Examination (70 marks)		tion (25) counted)	erval Evolut t of 3 will be	CIE-Continuous Interval Evolution (25) Average of best 2 out of 3 will be counted)
	05	Attendance- 05			
	TTERN	ASSESMENT PATTERN	AS		
, and Clifford Stein	nended Books: Introduction to Algorithms - Cormen, Thomas, Charles Leiserson, Ronald Rivest, and Clifford Stein Computer Algorithms, Henry F. Korth Algorithm, Schaums Outline Series Anny V. Levitin. Introduction to the design and analysis of Algorithms	th design and anal	ms - Cormer Henry F. Kor tline Series uction to the	nended Books: Introduction to Algorithms - Corme Computer Algorithms, Henry F. Ko Algorithm, Schaums Outline Series Anny V. Levitin. Introduction to the	Recommended Books: 1. Introduction to Algorithms - Cormen, 2. Computer Algorithms, Henry F. Korth 3. Algorithm, Schaums Outline Series 4. Anny V. Levitin. Introduction to the de
			tion using	ulate a solut	ternary search b. How to formulate a solution using these

COURSE TITLE: ALGORITHM DESIGN AND ANALYSIS LAB

	Write program with	•			
	Find a strategy to solve	•			
Assignment	Statement of the	CLO1 •	Introduce different types of Algorithm	ice differ	1-2 Introdu
are developed)	directed to achieve outcomes)				Week
Assessment	Teaching Learning	CLOs	CourseContents	Cou	
	eek):	Lesson Plan (as per week):	Lesson		
		~		CLO3	Outcome)
			~	CLO2	Program
			~	CL01	CLO to PLO
O10 PLO11 PLO12	PLO1 PLO2 PLO3 PLO4 PLO5 PLO6 PLO7 PLO8 PLO9 PLO10 PLO11 PLO12	04 PLO5 PLO	PLO1 PLO2 PLO3 PL		Mapping of
lems.	evaluate the performance of different algorithms in real-world problems	of different alg		CL03	CLO)
	ithms.	f different algor		CL02	Outcomes
	gineering problems.	algorithms in en	implement the different algorithms in engineering problems	CL01	earning
	students will be able to)	of the course,	Description (At the end of the course, students will be able to)	CLOs	Course
	ompiler, PowerPoint Slides	r, e-Tutorials, Co	Resources Used: Multimedia, Whiteboard, Marker, e-Tutorials, Compiler, PowerPoint Slides.	ed: Multir	esources Use
	erent algorithms. erent scenarios.	o implement diffigorithms in difficence complexity.	Explain to design and develop a program to implement different algorithms. Debug and test the performance of these algorithms in different scenarios. Conduct experiments to get time and space complexity.	n to design and test to texpering	 Explain to d Debug and t Conduct ex
SEE Marks: 70				03 .	Exam Hours: 03
Attendance: 10 Viva: 20			04	CSTE 21	Course Code: CSTE 2104
Language 10					

	ERN	ASSESMENT PATTERN Attendance- 10		
	and viva)	Final Lab Exam (Lab and VIVA)		13
	and Viva			
exercise book and online.	Discussion about the problem. Students will be given to do some problem to solve. Analysis the complexity.	CLO1, CLO2, CLO3	Graph Algorithms: - Spanning Tree - Shortest path algorithms - DAG.	12
	Find a strategy to solve it. Write program with C++or JAVA	•		
	Statement of the problem.	CLO1, •	Greedy Algorithm	=
	it. Write program with C++or JAVA	•		
exerci	Statement of the problem. Find a strategy to solve	CLO2, CLO3	Dynamic Programming	9-10
	it. Write program with C++or JAVA	•	b. Binary Search	
	problem. Find a strategy to solve	CLO2, CLO3	Search Paradigms:	7-8
Quiz 1(1 to 3 week)	Write program with C++or JAVA C++or fithe	•		
	Statement of the problem. Find a strategy to solve	CLO2,CLO3		2
Solve problem from	solve. Analysis the complexity.			
online.	Discussion are problem. Students will be given to do some problem to	CLO2,CLO3	S S	2
Solve problem from	C++or JAVA			

Evaluate	Analyze	Apply	Understand	Remember	Bloom's Category
	20	30	20		Test

COURSE TITLE: DIGITAL LOGIC DESIGN

Course Code: CSTE 2105	CIE Marks: 25
Credit Hours: 05	SEE Marks: 70
Exam Hours: 04	Contract of the Contract of th

Introduce the basic understanding of digital and logic circuits with their different components.

Provide knowledge of problem-solving in digital logic circuits & systems.

Familiarize the students with building blocks of combinational and sequential circuits so that they will be

able to develop circuit solutions. ial, Question

Lesson Flan (as per meny). Assessment		
Diom (as nor week):	CLO3	Outcome)
	CLO2	Program
	CL01	CLO to PLO
PLO1 PLO2 PLO3 PLO4 PLO3 PLO9 PLO9 PLO9 PLO9 PLO9 PLO9 PLO9 PLO9	P	Mapping of
design digital systems to solve real-life prooferrs.	CLO3	
Decoder, Multiplexer, De-multiplexer, RAM, ROM, etc using different logic gates.	CLO2 i	(CLO)
digital systems. Counter, Encoder,	0	Outcomes
understand the basics of digital systems, and could different	CLO1 u	Learning
CLOs Description (At the end of the course, students will differentiate between analog and	CLOs I	Course
the students will be able to	questions.	bank, Previous questions.
Resources Used: Multimedia, Whiteboard, Marker, Handouts, put 000ks, v-1 morrais,	d: Multime	Resources Use
The Handout and hooks a Tutorial's Device manual, Current		10000

Dutcomes	digital systems.	ms.	The fire flore	Counter, Encoder,
(CLO)	CLO2 implement Decoder, M	different types of digital ultiplexer, De-multiplex	implement different types of digital circuits such as implicipal different logic gates. Decoder, Multiplexer, De-multiplexer, RAM, ROM, etc using different logic gates.	rent logic gates.
	CLO3 design digit	design digital systems to solve real-life problems	IIIe problems.	010 PLO11 PLO12
Mapping of	PLO1 PLO	2 PLO3 PLO4 PLO5	PLO1 PLO2 PLO3 PLO4 PLO5 PLO6 PLO7 PLO8 PLO7 PLO8	
CLO to PLO	CLO1 V			
Program	CLO2 V			
Outcome)	CLO3	2		
		Lesson Plan (as per week):	er week):	Assessment
	CourseContents	CLOs	Teaching Learning Strategy (activities	Strategy (How they
Week			directed to achieve outcomes)	are developed)
	Introduction: Digital and analog	log CLO1	Lecture and discussion on detailed information about	Answering basic questions, quizzes,
systems,	systems, The introductory concept or number systems and codes. Digital	gital	the course, including the objectives, course	Homework etc.
represen	representation, Digital circuit, and Logic circuit, Logic Gates, Boolean Algebra	Algebra	outcomes, examinations.	
and Mir and vari	and Minimization: Boolean constants and variables, truth tables. Basic Logic	ic Logic	basics of digital and analog systems, number systems	
gates.			and logic gaies.	Answering basic
Logic G Minimiz	Logic Gates, Boolean Algebra and Minimization: Universality of NAND	a and CLOI	the universality of NAND and NOR gates and the	questions, quizzes, Homework etc.
and NOI algebrai	and NOR gates, Describing logic circuit algebraically, Evaluating logic circuit	circuit	implementation of logic circuits.	
outputs,	outputs, Boolean theorems, Delvioi gairs	MORBAILO		

	∞	7	6	5		
					4	3
digital clock.	Counters and Registers: Synchronous counter, Synchronous down counter, Synchronous up/down counters, Synchronous up/down counters, Decoding a counter, Decoding glitches, Cascading BCD counters, Shift-registers, Counter applications: frequency counter,	adder, Binary multiplier. Counters and Registers: Asynchronous counter: Ripple counters, Counters with mod numbers<2 ⁿ , IC asynchronous counters, Asynchronous down counter, Asynchronous up/down counter, Propagation delay in ripple counters.	Flip-Flops (FF): Clocked J-K FF, Clocked D FF, Master-slave FF, FF applications, FF synchronization, Data application, and transfer, Frequency division, and subtraction system, The addition, and subtraction system, The BCD adder circuit, Cascading BCD	Flip-Flops (FF): NAND gate latch, NOR gate latch, D latch, Clock signals and clocked Flip-Flops, Clocked S-C FF.	Combinational Logic Circuits Design: Designing combinational logic circuits, Designing Combinational logic circuits, Designing Combinational logic circuits, Exclusive OR and Exclusive NOR Exclusive NOR Exclusive OR and Exclusive NOR Exclusive	theorems. Implementing logic circuits from boolean expressions, Alternate from boolean expressions, Alternate logic-gate representations. Combinational Logic Circuits Design: Sum-of-product and product-of-sum Sum-of-product and product-of-sum simplifying logic circuits, forms, Simplifying logic circuits, algebraic simplification, Karnaugh map method.
CLO2	CLO2	CLO2		CLO2	CLO2,	
Demonstrate the basics,	Lecture on the design and implementation of different types of synchronous counter and a digital clock circuit. Exercise on related topics.	Lecture and discussion on the basics of a counter with the design and implementation of different types of an asynchronous counter. Exercise on related topics.	the design of J-K, D and Master-Slave FF. Lecture on the design of HA, FA, Parallel adder, Carry look-ahead adder and BCD adder.	and latch with the introduction of S-C FF. Lecture and discussion on Lecture and discussion on the state of the panel of		
CT-2 (topics of the	Ans ques Hon		Hom	Answering basic questions, quizzes,		

Create	Evaluate	Analyze	Annl	Unde	Reme	יססומ	Bloom	CIE-C				Recon 1. 2.	Lex.	13	13	12		11		10	
te	uate	vze	V	Understand	Remember		Ricom's Category	Average of best 2 out of 3 will be counted)	Interval Evolution (25)		3. An Introduct			preparation.	architecture, From Conception and Final exam	Memory Devices: Memory terminology, general memory operation, semiconductor memory technologies, different types of ROMs, semiconductor RAMs, static and dynamic RAMs, ROM architecture, RAM dynamic RAMs, ROM architecture, RAM	conversion circuitry, Digital ramp ADC.	Interfacing with the Analog World: Digital to analog conversion (DAC), D/A conversion circuitry, Summing amplifier, Analog to digital conversion (ADC), A/D	Digital IC terminologies, TTL logic family, TTL series characteristics, open-collector TTL, Tristate TTL, ECL family, MOS digital ICs, MOSFET, CMOS characteristics, CMOS tri-state logic, TTL CMOS-TTL interfacing.	MSI Logic Circuits: Encoders. Multiplexers and multiplexer applications, Demultiplexers.	decimal decoders, BCD-to-7-segment decoder/drivers.
			10	10	50	(25)	Test-1	of 3 will be co	rval Evolutio		IOII to Switch	s: ms: Principles and Compute ion to Switchi			nd Final exam	s: Memory learnoperation, semoperation, semogies, different fuctor RAMs, ROM architector architector respect.	try, Digital rar	the Analog W conversion (D. try, Summing conversion (A	Tristate TTL, ECL family, CMOS tri-state logic, TTI logic pries characteristics, open- Tristate TTL, ECL family, CS, MOSFET, CMOS tri-state logic, TTI pterfacing.	its: Encoders, multiplexer ultiplexers.	BCD-to-7-seg
			10	15	10	(22)	Test-2	ounted)	n (25)		ASSI	and Applic or Design by				iconductor types of static and ture, RAM	np ADC.	AC), D/A amplifier, DC), A/D	gic s, open- L family, IOS ogic, TTL	ice.	ment
A TOTAL	10			10	5	(20)	Assignment (25)	Agirnmen		Attendance-05	ASSESMENT PATTERN	ations by Roman M. Morris and Digital I		CLO2, CLO3	CLO1,		CLO2	CLO2,		CLO2	c d
CITAL LOGIC DESIGN LAB	Create	Evaluate	Analyze	Apply	Understand	Remember		Bloom's Category	SEE-Semester End Examination (70 marks)	e- 05	ATTERN	nended Books: Digital Systems: Principles and Applications by Ronald J. Tocci, Prentice Hall. Digital Logic and Computer Design by M. Morris Mano, Prentice Hall. Digital Logic and Computer Design by M. Morris Mano, Prentice Hall.	course. Discussion on the better answering methods for the final examinations.	on previous lectures and review the contents of the	Students will be asked to	the design and operation of RAM and ROM architecture. Exercise on related topics.	Lecture and discussion on	Lecture and discussion on the design and operation of ADC and DAC circuit. Exercise on related topics.	demultiplexer and demultiplexer circuit. Lecture and discussion on the basics of TTL, ECL, and CMOS digital ICs logic families.	Demonstrate the basics, design, and operations of different encoder,	design, and operations of the different decoder circuit.
AB									Examination (70 n			Hall. n,Khanna Publishers	or the	6	to Exercise methods		on Assignment-1	Answering basic of questions, quizzes, Homework etc.	Jic .	Answering basic questions, quizzes, Homework etc.	week's 5-8)
		15			30	20	^	Test	narks)						thods			s,			

Hours: 03 Hours: 03 Ployiectives: Design and analyze combinational and sequential logic circuits. Design and analyze combinational and sequential logic circuits. Design and analyze digital circuits for real-life problem-solving. Explain the usages of the basic software tools for the design and implementation of disystems. CLOS: Description (At the end of the course, students will be able to) CLOI understand the different gates and IC's. CLOI understand the different gates and IC's. CLOI understand the different combinational and sequential logic circuits. CLOI understand the different combinational and sequential logic circuits for solving a real-life problems. CLOI use modern tools to implement and analyze digital circuits for solving a real-life problems. CLOI use modern tools to implement and analyze digital circuits. CLOI pLOI pLOI pLOI pLOI pLOI pLOI pLOI p		Lecture and discussion on	CLO2	ng of	using J-K Flip-Flop. Design, construction and testing of	using J-K Flip-Flop. Design, construction	using J Design	5-6
CSTE 2106 SEE Marks: 603 Construction of the truth tables of the logic CLO2, CLO3 brown of the fruith tables of thefrent (CLO2, CLO3) Discussion and testing of Half construction of the truth tables of different CLO2, CLO3 brown and testing of Half construction and discussion on the beginning of the construction and testing of Half construction of the truth tables of different and construction and discussion on the beginning of the truth tables of different and construction and discussion on the period. CLO3 brown and testing of Half construction of the truth tables of different construction and discussion on the period. CLO3 brown and testing of Half construction and testing of Half construction and discussion on the period. CLO3 brown and testing of Half construction and discussion on the period. CLO3 brown and testing of Half construction and discussion on the period. CLO3 brown and testing of Half construction and testing of Half construction. CLO4 brown and testing of Half construction and discussion on the period. CLO5 brown and testing of Half construction and discussion on the period. CLO6 brown and testing of Half construction and different construction and different close the period. CLO6 brown and testing of Half construction and different close the period. CLO6 brown and testing of the course. CLO7 brown and testing of Half construction and different close the period. CLO6 brown and testing of Half construction and different close the period. CLO7 brown and testing of the construction and discussion on the period. CLO8 brown and testing of Half construction and different close the period. CLO9 brown and testing of the course and the course and the construction and different close the period. CLO9 brown and testing the period. CLO9 brown and te		Hip-Flop with tutorials and then practice.		lops by	and T Flip-F	ops. ation of D	Realiza	THE
CSTE 2106 SEE Marks: 603 Attendance: Structure to principles and methodology of digital logic design at the gate level. In and analyze digital circuits for real-life problem-solving: an analyze digital circuits for real-life problem-solving. In the usages of the basic software tools for the design and implementation of digital circuits. CLO3 Description (At the end of the course, students will be able to) CLO3 Description (At the end of the course, students will be able to) CLO3 Understand the different gates and IC 's. CLO4 Understand the different gates and IC 's. CLO5 gain teamwork skills for working effectively in groups. CLO6 PLO6 PLO5 PLO6 PLO6 PLO7 PLO8 PLO9 PLO10 PLO10		Lecture and discussion on		of different	e truth tables	ation of th	Verific	3-4
tives: 03 SEE Marks: 04 SEE Marks: 06 SEE Marks: 07 SEE Marks: 08 And analyze combinational and sequential logic circuits. 1 and analyze digital circuits for real-life problem-solving. 1 the usages of the basic software tools for the design and implementation of digital circuits in the usages of the basic software tools for the design and implementation of digital circuits. CLOS Description (At the end of the course, students will be able to) CLO3 Description (At the end of the course, students will be able to) CLO3 Description (At the end of the course, students will be able to) CLO3 Description (At the end of the course, students will be able to) CLO4 Description (At the end of the course, students will be able to) CLO4 Description (At the end of the course, students will be able to) CLO4 Description (At the end of the course, students will be able to) CLO5 Description (At the end of the course, students will be able to) CLO4 Description (At the end of the course, students will be able to) CLO5 Description (At the end of the course, students will be able to) CLO6 Description (At the end of the course, students will be able to) CLO6 Description (At the end of the course, students will be evelvaluate of the beginning of a call the period. Answer basic (ND, OR, NAND) Respected Teach and period. The course of the logic CLO1, CLO5 Description and then the beginning of a beriod. The proof of the universality of NAND The period of the period of the period of the period. The proof of the period of the period.		Discussion and practice.	CLO2, CLO3	ng of a ircuit. ng of Half	ion and testii nd checker c ion and testii der circuits.	construct generator a construct Full Add	Design parity g Design Adder	2
CLO3 CLO3 COLO3 COLO5 CLO4 CLO5 CLO6 CLO6 CLO7 PLO1 PLO2 PLO3 PLO3 PLO3 PLO3 PLO4 PLO5 PLO5 PLO5 PLO5 CLO5 CLO5 CLO5 CCLO5 CCLO5 CCLO5 CCLO5 CCLO5 CCLO5 CCLO5 CCLO5 CCLO5 CCLO6 CCLO6 CCLO6 CCLO7 CCLO7 CCLO7 CCLO7 CCLO7 CCLO7 CCLO6 CCLO6 CCLO7 CCLO	Answer basic questions. Neatness, organization, completeness and individually written lab reports are due at the beginning of the lab period. Respected Teacher will be evaluated in lab period.		CL01, CL05	of the logic NAND,	e truth tables NOT, NOR, etc). universality	ation of the AND, OR, Ex-NOR tion of the DR gate.	Verific gates (/ Ex-OR, Realiza and NC	
itives: 103 103 SEE Marks: 103 SEE Marks: 103 SEE Marks: 104 SEE Marks: 105 SEE Marks: 107 SEE Marks: 108 SEE Marks: 109 SEE Marks: 100 SEE Marks: 1	Assessment Strategy (How the are developed)	aching Learning rategy (activities rected to achieve outcomes)	CLOs		rseContents	Cou		Week
CLO3 CLO3 Attendance: CLO3 CLO4 CLO4 CLO4 CLO5 CLO5 CLO5 CLO5 CLO5 CLO5 CLO6 CLO6 CLO7		week):	Plan (as per	Lesson	The state of			
CLO3 CLO3 Attendance: SEE Marks: SEE M		~				CLO5		
itives: (2) (3) (3) (4) (1) (2) (2) (2) (3) (4) (5) (5) (5) (6) (7) (7) (8) (8) (8) (8) (9) (9) (1) (1) (1) (1) (1) (2) (2) (2			2			CLO4		
CLO3 CCLO3 CCLO3 CCLO3 CCLO3 CCLO3 CCLO3 CCLO3 CCLO3 CCLO4 CCLO3 CCLO4 CCLO3 CCLO4 CCLO5 CCLO5 CCLO5 CCLO5 CCLO5 CCLO5 CCLO5 CCLO6 CCLO7 CCL				2	~	CL03	come)	Outo
iceste 2106 icost itives: und analyze combinational and sequential logic design at the gate level. und analyze digital circuits for real-life problem-solving. and analyze digital circuits for real-life problem-solving. and analyze digital circuits for real-life problem-solving. and analyze digital circuits for real-life problem-solving. The usages of the basic software tools for the design and implementation of digital circuits on the usages of the basic software tools for the design and implementation of digital circuits. CLO3 CLO4 Understand the different gates and IC's. CLO3 design and analyze digital circuits for solving a real-life problems. CLO4 understand the different gates and IC's. CLO4 understand the different gates and IC's. CLO5 gain teamwork skills for working effectively in groups. CLO6 PLO1 PLO3 PLO1						CLO2	gram	(Pro
tives: (CSTE 2106 (CLO3 (CLO3 (CLO4 (CLO5 (Cambridge and malyze digital circuits for real-life problement and analyze digital circuits for working effectively in groups. (CLO5 (CLO5 (CLO6 (CLO6 (CLO6 (CLO6 (CLO7			O4 FLO3 FL	Z FLOS FI	V RLO	CL01	to PLO	CTC
Attendance: Viva: Hours: 03 Objectives: Introduce the principles and methodology of digital logic design at the gate level. Design and analyze combinational and sequential logic circuits. Design and analyze digital circuits for real-life problem-solving. Explain the usages of the basic software tools for the design and implementation of digital circuits systems. Test Used: Multimedia, Whiteboard, Marker, Handouts, pdf books, e-Tutorials, Lab equipment software. CLO3 Description (At the end of the course, students will be able to) CLO4 use modern tools to implement and analyze digital circuits. CLO4 use modern tools to implement and analyze digital circuits. CLO5 roin towards delite for morbinational and sequential logic circuits. CLO6 roin towards delite for morbinational and sequential logic circuits.	010 PLO11 PLO1	OK PLO7 PLO8 PLO9 PLO	MOINING CITE	OI K SKIIIS IO	gaill Icalliw	CLOS	ning of	Man
e Code: CSTE 2106 # Hours: 03 Objectives: Introduce the principles and methodology of digital logic design at the gate level. Design and analyze combinational and sequential logic circuits. Design and analyze digital circuits for real-life problem-solving. Explain the usages of the basic software tools for the design and implementation of digital circuits systems. Systems. CLOs Description (At the end of the course, students will be able to) CLO1 understand the different gates and IC's. CLO2 implement and analyze digital circuits for solving a real-life problems. CLO3 design and analyze digital circuits for solving a real-life problems.		alyze digital circuits.	lement and and	tools to imp	use modern	CLO4		
e Code: CSTE 2106 Hours: 03 Objectives: Introduce the principles and methodology of digital logic design at the gate level. Design and analyze combinational and sequential logic circuits. Design and analyze digital circuits for real-life problem-solving. Explain the usages of the basic software tools for the design and implementation of digital circuits systems. The ces Used: Multimedia, Whiteboard, Marker, Handouts, pdf books, e-Tutorials, Lab equipment is, Quartus software. CLOs Description (At the end of the course, students will be able to) CLO1 understand the different gates and IC's. CLO2 implement and analyze different combinational and sequential logic circuits.		solving a real-life problems.	al circuits for s	analyze digir	design and	CL03	9	(CLO)
CLOs Description (At the end of the course, students will be able to) Attendance: Attendance: Viva: Attendance: SEE Marks: SEE Marks	c circuis.	inational and sequential logic	different comb	and analyze	implement :	CLO2	comes	Out
Attendance: Hours: 01 Hours: 03 Objectives: Introduce the principles and methodology of digital logic design at the gate level. Design and analyze combinational and sequential logic circuits. Design and analyze digital circuits for real-life problem-solving. Explain the usages of the basic software tools for the design and implementation of digital circuits systems. ces Used: Multimedia, Whiteboard, Marker, Handouts, pdf books, e-Tutorials, Lab equipment s, Quartus software. CLOs Description (At the end of the course, students will be able to)	circuite	S.	t gates and IC':	the differen	understand	CL01	rning	Lea
ples and methodology of digital logic design at the gate level. combinational and sequential logic circuits. digital circuits for real-life problem-solving. of the basic software tools for the design and implementation of digital circuits edia, Whiteboard, Marker, Handouts, pdf books, e-Tutorials, Lab equipment		e, students will be able to)	of the course	At the end	Description	CLOs	rse	Course
E 2106 Attendance: Viva: SEE Marks: analyze combinational and sequential logic design at the gate level. analyze digital circuits for real-life problem-solving. usages of the basic software tools for the design and implementation of digital circuits		"	rker, Handout	teboard, Ma	imedia, Whi	sed: Multi rtus softwa	ources Unuals, Quar	Reso
E 2106	f digital circuits an	design at the gate level. ircuits. solving. lesign and implementation of lesign at the gate level.	of digital logic quential logic c l-life problem-s tools for the d	nethodology ional and sec cuits for rea sic software	nciples and n /ze combinat /ze digital cir ges of the bas	uce the pri n and analy n and analy in the usag	> Introd > Design > Design > Design > Expla > systen	0
TE 2106						: 03	m Hours	Exa
Attendance: 10	SEE Marks: 70				06	: CSTE 21	ırse Code	Core
	Attendance: 10							

-	Design, construction and testing of					
	L'CCt coverchronous counter	CLO2	Lecture and discussion on			
7-8	Design, construction and testing of a different Decoder circuit using logic gates and Decoder IC. Design, construction and testing of a different Encoder circuit using logic gates		Decoder and Encoder circuits with tutorials and then practice.			
	1 17	CLO2	Lecture and discussion on the concepts of Multiplexer			
9	Design, construction and testing of a multiplexer by using circuit using logic gate and MUX IC. Design, construction and testing of different de-multiplexer by using circuit		and De-multiplexer circuits and practice.			
	' lagra gate and MOA to	CLO3	Lecture and discussion with			
10-11	Solving some real life problems using a combination of different logic gates. Using software tools for the design and implementation of digital circuits and systems. Perform other experiments relevant to this	CLO4	real life problems. Demonstration on Quartus Software.			
	course.	it a mini pr	oject in a group	A THE PROPERTY.		
12	Suom	b Evam (Jo	b, Quiz and Viva)	Harris Contract		
13				THE RESERVE TO SERVE		
	ASSE	SMENT PA	TTERN	The state of the same		
		Attendance Viva- 20				
	SFF-Semester	End Exam	nation (70 marks)			
	Bloom's Categor	ry				
	Remember		10			
	Understand	25 1 3 - 172	30			
	Apply	The same	10			
	Analyze		20			
	Evaluate		20			
	Create	The same of the same	The state of the s	Description of the		

COURSE TITLE: THEORY OF COMPUTATION

		COURSE TITLE: THEORY OF COMPOTATION Attendance: 05
Course Code: Credit Hours: Exam Hours:	03	O7 CIE Marks: 25 SEE Marks: 70
Course Objects > Introduction language	ce the mages and granthemages the notion	ons of algorithm such as decidability, complexity, and computability. media, Whiteboard, Marker, Handouts, pdf books, e-Tutorials, Device manual, Question
Course Learning Outcomes	CLOs CLO1	Description (At the end of the course, students will be able to) understand the concepts of finite automata and the transform between equivalent deterministic and non-deterministic finite automata.

CLO)		CLO2	expla	in the s	tructura	l repre	sentations	Wileir d			1	ch as gramn	ime and	
			regula	ar expre	ssions.	Compl	ntation suc	ch as de	ecida	bility an	id tracta	Diffty, and t	mie and	
		CLO3	analy	ze the I	ment f	or com	plex theori	ies.		T-	- CO DI	O10 PLO1	1 PLO1	
			space	manage	DI O3	PLO4	PLO5 PI	O6 PL	O7	PLO8 P	LO9 PI	Olortor	I LOI	
I appi	ing of		PLO1	PLOZ	PLOS	LOT	1200							
	o PLO	CLO1	,											
Progr earni		CLO2	1						_					
outco		CLO3		1										
, ureo					Les	son Pla	an (as per	week):		T - a w	ning	Assessi	ment	
Week		Cou	ırseCoı	itents			CLOs	Str	rateg	ng Lear gy (activ d to ach tcomes)	ities ieve	Strategy (F are deve	How the loped)	
	Automata: Preliminary Concepts of Automata, computability, and complexity introduction to formal proof, and types of proofs Finite Automata: Types of finite						CLO1 Lecture and discussion with Answer						ork, exams.	
2	autom	Automa ata, exam	ples of	finite at	ite itomata	,	CLO1	Lecture and discussion about finite automata and types of finite automata such as DFA and NFA. 2 Lecture and problem				Answer basic questions, quizzes, Homework, exams. Answer basic		
3	Finite Automata: Equivalence of NFA and DFA's, finite automata with epsilo transitions. Regular Expressions: Concepts of regular expression, equivalence with finite automata, and applications of				on .		solving on DFA, NFA and regular expression			questions, quizzes, Homework, exams.				
4	langu	ages, clos	sure pro equivale	ence and	of regul	gular CI ar	CLO1, CLO2 Lecture and discussion with problems.					Homework, exams.		
5	Regu Lang	nization of lar Languages - T	guages:	Non-reg	ular		CLO2	proble	ems;	pumping	lemma	Class Test 1(topics of the Week 1-4)		
6	Languages - The pumping lemma for regular languages. Context-Free Grammars and Languages: Formal definition of a context-free grammar, examples of context-free grammar, constructing pars trees, and ambiguity in grammars and				arse	CLO2	Lectur		d discuss	ion	Answer basic questions, quizzes, Homework, exams.			
7	trees, and ambiguity in grammars and languages. Properties of Context-free Languag Context-free Grammar Simplification.			ges:	CLO2	Lecture and discussion on Grammar simplification. LO2 Lecture and discussion on pushdown automata and its relation with context-free grammars. Answer basic questions, qui Homework, expression on pushdown automata and its relation with context-free grammars.					quizzes, , exams.			
8	Context-free Grammar Simplification and Chomsky normal form. Pushdown Automata: Formal definition of pushdown automata, examples of pushdown automata, and equivalence											LO1, CLC	quizzes,	
	with	n context- nputabili	free gra	mmars.	mal	C	LO1, CLC	2 Lectu	re an	d discuss	sion on	Class Test	2(topics	

	definition of Turing machine, Nondeterministic Turing machines, and	- i, a.v.	Turing machine.	of the Week 5-8)
10	Hilbert's problems Decidability: Decidable languages, the halting problem – the diagonalization	CLO3	Lecture and discussion on language decidability.	Answer basic questions, quizzes, Homework, exams.
11	method. Complexity Theory: The Classes P and NP, examples of problems in these classes, the differences between P and NP, NP-Completeness, polynomial time reducibility, and the Cook-Levin	CLO3	Lecture and discussion on complexity theory.	Answer basic questions, quizzes, Homework, exams.
12	Theorem. Examples of NP-Complete Problems: The vertex cover problem – the Hamiltonian path problem, the subset sum problem, approximation algorithm, and	CLO3	Lecture and discussion on NP complete problems.	Class Test 3 (topics of the Week 9-12)
13	probabilistic algorithms. Applications: Analysis and classification of Biochemical reactions and the complexity of evolved organisms.	CLO3	Lecture and discussion on the application of complexity theory.	Exercise the answering methods in the final exam.

Recommended Books:

- 1. Introduction to Automata Theory, Languages and Computation by Hopcroft and Ulman, Addison
- 2. Elements of the Theory of Computation by Lewis and Papadimitriou, Prentice Hall.
- 3. Compiler design in C by A.J. Holub, Prentice-Hall.
- 4. Elements of Automata Theory by Jacques Sakarovitch, Cambridge University Press.
- 5. A Textbook on Automata Theory by P.K. Srimani and S.F.B Nasir, Cambridge University Press.

ASSESMENT PATTERN

Attendance- 05

CIE-Continuous Interval Evolution (25) (Average of best 2 out of 3 will be counted)

Average of best 2 out Bloom's Category	Test-1 (25)	Test-2 (25)	Assignment (25)
Remember	5		
	10	10	10
Understand	10	15	15
Apply	10		
Analyze			
Evaluate			
Create			

marks)

Bloom's Category	Test
Remember	10
Understand	25
Apply	35
Analyze	
Evaluate	
Create	

COURSE TITLE: INDUSTRIAL MANAGEMENT AND ACCOUNTANCY

COURSE ITTLE: INDUSTRIALE IN A	Attendance: 05
Course Code: HUM 1201 Credit Hours: 03	CIE Marks: 25 SEE Marks: 70
Exam Hours: 04	

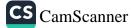
Course Objectives:

- Make the students familiarize themselves with business concepts.
- > Analyze and apply different strategies of marketing.
- > Effective use of basic accounting in different application designs.

Resources Used: Multimedia, Whiteboard, Marker, Handouts, pdf books, e-Tutorials, Device manual, Question

2 Management and Organizational concepts Management principles and functions, Levels of management,	CLO CLO	bank, Previous questions Course Learning Outcomes (CLO) CLO2 Mapping of CLO3
Management and Organizational	Contents Ty,	Description (understand the strategy. use basic or application de gather know
	Lesson Plan (as per week): CLOs Ter CLO1 Lecture detaile	nd of the course pt of business, pt and knowledge ental knowledge out human resources
students. Brief discussion about business. Addiscussion with Answer basic	aching Learning aching Learning activities rected to achieve outcomes) and discussion with d information about dree, including the	Accounting, mana of management and ce management and ce management and
questions, quizzes, Homework, exams.	Ass Strateg are d Answer question	and management unting in different al relation.

11 D 20 A C B 50	10 OJ	9 Man	8 ser dia del	7 Prolife Proand	6 Hea Env Acc pub Env air,	5 Hur 5 Indu Con HRN selee Indu of gy part Mot barg Payy enri
Basics of Accounting: Concepts of accounting, Accounting equation, classification of account, Double entry system, Accounting cycle journal, ledger and trial	and Industrial arts, and diagram ations, al planning, lem solving izations and	k, reorder, level, ty, Stores occedures, Bin idling, nes, conveyors,	service and service management, Service management in IT industry, IT-IL system diagram, framework, Service support, delivery, facility management, System audit and internal control.	ject and project management, Project cycle, scope management, posal, Project scheduling, budgeting procurement, Project monitoring and luation.	Health, Safety and Industrial Environment: Accidents, Safety consciousness, publicity, procedures, and measures. Environmental pollution, control acts for air, water, solid waste and noise.	Human Resource Management and Industrial Relations: Concept of HRM, HRM functions and model, recruitment, selection Industrial relations and disputes, handling of grievances, labor welfare, Workers' participation, Motivation, leadership, collective bargaining, training and trade union, Payment, job satisfaction and job enrichment
CLO2	CLO2, CLO3	CLO1, CLO2	CLO1, CLO2	CO1, CO2	CLO3	CLO3
Lecture and discussion about accounting, its cycle journal, ledger, trial balance and financial statement analysis.	about operations research, methods of job analysis and decision making and concepts of standardization			Lecture and discussion about project management and its life cycle, scope, scheduling, budgeting.	and	Lecture and discussion about HRM and its functions and models, workers payment recruitment and job enrichment.
Quizzes, Homework, e exams.		of the week's5-8)	Answer basic questions, quizzes, Homework, exams.	Answer basic questions, quizzes, Homework, exams.		Class Test 1(topics of the week's 1-4)



and armor mellious	miscellaneous subjects	CLO2,	Miscellaneous and Final exam preparation	13
n Exercise the	recture and discussion on Exercise the	200	CVP relationship	
of the week's9-12)	Cost concepts, break-even of the week's9-12) analysis and CVP relationship	CLO2	Cost Accounting: Cost concept, Contribution margin, ratio analysis, Break-even analysis,	12
Class Test 3 (topic	Class Test 3 (topics		balance, Preparation of financial statements, Financial statement analysis and interpretation: ratio analysis	

Recommended Books:

- Fundamental of Management by Dr. Mainul Islam
- Human Resource Management by Dr. Abdul Awal Khan and Dr. Abu Taher.

 Accounting Principles by JJ Weygandt, DE Kieso, PD Kimmel, Latest Edition, John Wiley.
- Managerial Accounting by Garrison, R H and Noreen, EW, 10th Edition, McGraw-Hill.
- Introduction to Management Accounting by Horngren, CT and Gary L Sundem, Prentice. Advanced Management Accounting by Kaplan, RS & AA Atkinson, Prentice Hall.
- 0 0

ASSESMENT PATTERN

IE-Continuous Interval Evolution (25)	erval Evoluti	ion (25)		SEE-Semester End Examination (70 marks)	nation (70 marks
verage of best 2 out of 3 will be coulled)	t of 3 Will be	counted)			Test
Hom's Category	Test-1	Test-2	Assignment	Bloom's Category	
	(35)	(25)	(25)		10
	05			Remember	16
Remember	CO			Thedoretand	CI
	10	10	05	Understand	15
Inderstand	7	10	10	Apply	10
Apply	3	O.T.	10	Anglyze	10
O VIII	5	0	10		10
Analyze				Evaluate	200
					CO

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OHIDIAIAI

COURSE TITLE:MATRICES, VECTOR ANALYSIS AND CO-ORDINATE GEOMETRY

CLOs Description (At the end of the course, students will be able to) Course Learning Outcomes (CLO2 explain the relation between matrix and vector. CLO3 perform matrix decomposition using different theorems and algorication apply vector differentiation, integration, and coordinate geor complex engineering problem.	Course Objectives: Introduce the basic matrix transformation and its operations. Provide knowledge about matrix decomposition using theorem and algorithm Explain vector differentiation, vector integration, and concepts of coordinate geometry to solve engineering problems. engineering problems. Resources Used: Multimedia, Whiteboard, Marker, Handouts, pdf books, e-Tutorials, Question bank, Previous	Course Code: MATH 2105 Credit Hours: 03 Exam Hours: 04
Description (At the end of the course, students will be able to) understand different types of matrices and their operations. explain the relation between matrix and vector. perform matrix decomposition using different theorems and algorithm. apply vector differentiation, integration, and coordinate geometry in solving a complex engineering problem.	Introduce the basic matrix transformation and its operations. Introduce the basic matrix transformation and its operations. Provide knowledge about matrix decomposition using theorem and algorithm Explain vector differentiation, vector integration, and concepts of coordinate geometry to solve engineering problems. engineering problems. The vector differentiation and concepts of coordinate geometry to solve engineering problems.	Attendance: 05 CIE Marks: 25 SEE Marks: 70

	9		7	6	5	4	S	2		Week			Outcome)	(Program	CLO to PLO	10 Surdderer
12.4	Vec surf don	Vect deriv phys Sole	Vecto vecto Scala geon	Matr applio Theor	Matr Decor	Matri Decor Decor	Matri Orthor Gram-	Matrix Ter matrix, row Matrices, N Matrix, dist and matrix.	Matrix present matrice matrice and inv				ne)	no mr	PLO	10 21
ITTOMA	Vector Integration: Line integration: Line integral and volume integral and volume integral done by a force-Statement and Verification of Green's theorem	Vector differentiation: Directional derivative-Divergence and Curl-Their physical meaning-Relations involving Solenoidal and irrotational fields-Scal potentials (simple problems).	Vector differentiation: Derivative of vector function-Velocity and accelerati Scalar and vector fields-Gradient- It's geometrical interpretation	Matrix Decomposition: Physical application of Matrix Decomposition Theorem, Mathematical Analysis of Matrices using MATLAB.	Matrix Decomposition: LU Decomposition, QR decomposition, Cholesky decomposition.	Matrix Decomposition: Eigen Decomposition Theorem, Singu Decomposition (SVD).	Matrix Terminology: Normal Vector, Orthonormal Vectors, Orthogonality, Gram-Schmidt Orthonormalization Process, co-variance matrix,	Matrix Terminology: augmented matrix, row operation method, rank of Matrices, Mathematical Problems using Matrix, distinguish between determinan and matrix.	Matrix Terminology: Vector presentation by matrix, different types of matrices, algebraic operations on matrices, Transpose of a Matrix, Adjoint and inverse of a matrix,	Cor		CLO4	CLO3	CLO2	CL01	
-	gration: ral and v rce-State of Green	vergence ning-Read irrotate mple pro	entiatio n-Veloc ctor field nterpreta	mpositio Matrix I thematic g MATL	npositio n, QR de ompositi	aposition 1 Theore 1 (SVD)	nology: 'ectors, ' Orthon	nology: eration n ematical uish bety	matrix, and matrix, and oper pose of a matrix,	CourseContents		1	2	~	2	
21-3-	Line into olume in olume in ment an i's theor	n: Dire and Culations ir ional fie blems).	n: Derivity and a ity and a is-Gradition	n: Phys Decomposition al Analy AB.	n: LU compos on.	n: Eiger m, Sing	Normal Orthogor Ormaliza atrix,	augmen nethod, r Problen veen det	/ector different ations of Matrix,	tents						-
Verilland theorem and	Vector Integration: Line integral, the surface integral and volume integral-work done by a force-Statement and Verification of Green's theorem	Vector differentiation: Directional derivative-Divergence and Curl-Their physical meaning-Relations involving-Solenoidal and irrotational fields-Scalar potentials (simple problems).	Vector differentiation: Derivative of vector function-Velocity and acceleration-Scalar and vector fields-Gradient- It's geometrical interpretation	sical osition sis of	ition,	Matrix Decomposition: Eigen Decomposition Theorem, Singular Value Decomposition (SVD).	Vector, nality, tion	Matrix Terminology: augmented matrix, row operation method, rank of Matrices, Mathematical Problems using Matrix, distinguish between determinant and matrix.	Matrix Terminology: Vector presentation by matrix, different types of matrices, algebraic operations on matrices, Transpose of a Matrix, Adjoint and inverse of a matrix,		Lesson					
				0	C		CI	CL	CL01	CLOs	Lesson Plan (as per week):					
CLO4		CLO4	CLO4	CL03	CL03	CLO3.	CLO2	CLOI		Os .	as per v					
Lecture	vector i	Lecture solving.	vector differentiation.	solving.	Lecture and discussion about problems.	Lecture and practice	Lecture and problem solving.	Lecture and discussion about matrix operation.	Lecture and discussion on matrix	Teach Strate direct	veek):					
Lecture and practice	vector integration.	Lecture and problem solving.	ifferentia	and prob	ind discublems.	nd pract	nd probl	nd discus	d discus	Teaching Learning Strategy (activities directed to achieve outcomes)	The same					2000
CIICC.	ortice	Lecture and problem solving. I ecture and discussion on	vector differentiation.		ISSION	ice.	em	ation.	sion on	rning vities hieve	Section 1					1
	-				of the	various mathemat problems.	Answe questic Homey	Answer basic questions, qui Homework, e	Answer basic questions, qui Homework, e	Ass Strateg are						0 200
	of the weeks>-8) Answer basic	questions, quizzes, Homework, exams. Class Test 2(topics	questions, quizzes, Homework (word size expansion, memory location expansion), exams.	questions, quizzes, Homework, exams.	of the week's 1-4)	Exercise with various mathematical problems.	Answer basic questions, quizzes, Homework, exams.	Answer basic questions, quizzes, Homework, exams.	Answer basic questions, quizzes, Homework, exams.	Assessment Strategy (How they are developed)						

Dyanua	Evaluate	Analyze	Apply	Und	Rem	Bloo	CIE-C (Avera			Neco	D			10	12				12			=		
date	nate	lyze	ly	Understand	Remember	Bloom's Category	CIE-Continuous Interval Evolution (25) (Average of best 2 out of 3 will be counted)			Vector Analysi Analytical Geo Advanced Eng	straight line through two points.	between two planes; Equation of a	through three given points; Angle	dimensions: Equation of a plane; Plane	Coordinate Geometry of three	cosine and ratio; the angle between two	distance between two points; Direction	dimensions: a system of coordinates, the	Coordinate Geometry of three	equation of second degree	dimensions: Change of axes, General	Coordinate geometry of two	evaluating the Integrals.	Gauss's Divergence theorem-their use in
	The state of the s		15	5	5	Test-1 (25)	erval Evoluti t of 3 will be			ysis and An I Geometry of T Ingineering M	bee two por	anes; Equation	iven points; A	quation of a p	ometry of th	; the angle be	en two points;	system of co	ometry of th	ond degree.	hange of axes	ometry of tw	ntegrals.	ence theorem
The state of the s			20	3		Test-2 (25)			ASSI	ntroduction to hree Dimens athematics by	III.S.	n of a	Ingle	olane; Plane	ree	tween two	Direction	ordinates, the	ree		, General	0		their use in
			23	25		Assignment (25)		Attendance- 05	ASSESMENT PATTERN	o Tensor Analion by Vasistly ErwinKrey					CLO4				CLO4			CLO4		
Create	Evaluate	Analyze	Apply	Underständ	Kemember	Bloom's Category	SEE-Semester End Examination (70 marks) Test	05	TTERN	Vector Analysis and An Introduction to Tensor Analysis by M. R. Spiegel, S. Lipschutz, McGraw-Line. Analytical Geometry of Three Dimension by Vasistha and Agarwal, Krishna. Advanced Engineering Mathematics by ErwinKreyszig, Wiley Eastern.				practice.	Problem solving and			problems.	Lecture and discussion on		coordinate geometry.	Lecture and discussion on		
The state of the s				50	10	10	ation (70 marks) Test			schutz, McGraw-Line	uill uill			in the final exam.	Exercise the				of the weeks9-12)	Class Test 3(topics	V. Accessory	Quizzes, Homens	Homework, chamb	questions, quizzes,