

COMPUTER ENGINEERING

III Semester

			Hoi V	urs Vee	per k	Credits	redits Maximum Marks		
Sr No	Course Code	Course Title	L	т	Р		Continual Assessment	End Sem Examination	Total
1	AS303T	Applied Mathematics – III	4	-	-	4	30	70	100
2	CE301T	Computer Architecture	3	-	-	3	30	70	100
3	CE302P	Computer Lab - I	-	-	4	2	25	25	50
4	CE303T	Data Structures	4	-	-	4	30	70	100
5	CE303P	Data Structures lab	-	-	4	2	25	25	50
6	CE304T	Digital Circuits and Fundamentals of micro- processor	4	-	-	4	30	70	100
7	CE304P	Digital Circuits and Fundamentals of micro- processor Lab	-	-	2	1	25	25	50
8	H 102	Universal Human Values - II	3	-	-	3	30	70	100
9	CE305T	Career Development-I	2	-	-	0	Audit		
		Total	20	-	10	23	225	425	650

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
A 6202T	Applied Methometics III						CA	ESE	Total
A33031	Applied mathematics-in	4	-	-	4	30	70	100	

Course Objectives	Course Outcomes
 The aim of this course is To introduce the essential concepts of Numerical Computational techniques & Theory of Probability. To familiarize the students with concepts in linear algebra and statistics. 	 Students will be able to Analyze and solve problems by numerical computation met hod for Transcendental equations and System of linear equations. Identify engineering problems related to Matrices: Eigen value & Eigen vectors & Functions of Matrices. Apply various concepts of vector spaces. Apply various concepts of joint distribution. Use statistical methods and tools in engineering problems.

[8Hrs

Unit I

Numerical Methods: Error in numerical calculations, Solution of Algebraic and Transcendental Equations: Method of False position, Newton-Raphson method, Solution of system of simultaneous linear equations: Gauss elimination method and Crout's method Largest Eigen value and Eigen vector by Iteration method. Euler modified method, Runge Kutta method. [7Hrs Unit II

Matrices: Linear dependence of vectors, Characteristics equation, Eigen values and Eigen vectors, Reduction to diagonal form, Reduction of quadratic form to canonical form by orthogonal transformation, Sylvester's theorem. [6Hrs

Unit III

Vector Space: Subspaces, Linear Dependence/Independence, Basis, Dimension, Linear transformation, Range Space and Rank, Null Space and Nullity, Rank nullity theorem, Matrix Representation of a linear transformation, Linear Operators on Rⁿ and their representation as square matrices.

Unit IV

Text Books

[7Hrs Probability: Baye's rule, Review of discrete and continuous random variables, Joint probability function of discrete random variable, Marginal probability function and Conditional distribution of discrete random variable, Mathematical expectation of discreterandom variable, Variance and Standard deviation, and Covariance of joint distribution. Unit

[7Hrs

Statistics: Multiple regression analysis, Regression equation of three variables, Measures of central tendency, Mean, Median, Mode, Mean deviation, Standard deviation, Testing a hypothesis, Null hypothesis, Alternative hypothesis, t-test, F-test and Chi square test.

S N	Titlo	Authors	Edition	Publishor
3.N	Title	Autions	Edition	Fublishei
1	Linear Algebra and Its Application	Gilbert Strang	2007	Nelson Engineering
-	(Paperback)			
2	Higher Engineering Mathematics	B.S. Grewal	40th Edition	Khanna Publication
3	Theory & problems of Probability and	Murrav R. Spiegel		Schaum Series.
-	Statistics	,		Mc Graw Hills
1	Introductory mothodo of Numerical	S.S. Sootny		
4	introductory methods or Numerical	5.5. Sasiry		FUI
	Analysis			
Refere	nce Books			
S.N	Title	Authors	Edition	Publisher
1	Advanced Engineering Mathematics	Erwin Kreysizig	8 th Edition	Wiley India
2	Linear Algebra	Seymour Lipschutz etal	3 rd Edition	Schaum series.
3	First course in Linear Algebra	Nagpaul.		Wilev Eastern Ltd. New
_		- 37,		Delhi
4	A Text Book of Engineering Mathematics	N. P. Bali & M. Goval		Laxmi Publication.

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						CA	ESE	Total	
CE301T	Computer Architecture	3	-	-	3	30	70	100	
							·		
	Course Objectives		Course Outcomes						
This course is inten	ded	St	Students will be able to						
To provide ur	nderstanding of design of Computer		 analyze and describe different computer architectures. 						
Architecture a	nd organization.		 Solve various computer arithmeticproblems 						
 To provide understanding of issues involved in design of control unit. 			 analyze the complete execution of instruction using different control units. 						
• To understand the concepts of memory organization and			understand I/O device interfacingand computer memory						

Unit I

its interfacing.

Basic structure of computers: A Brief History of computers Designing for Performance Von Neumann Architecture, Computer Components - Interconnection Structures - Bus Interconnection - Addressing modes - Instruction Set Architecture (Instruction set based classification of processor i.e. RISC, CISC, RISC vs CISC Comparison).

hierarchy.

processor

understand various methods inparallel organizations of

Unit II

Arithmetic Unit : Addition & subtraction of signed numbers - Binary Multiplication: Booths algorithm - Unsigned Integer multiplication and division algorithm - Floating point operations

Unit III

Processing unit : Machine Instruction characteristics, types of operands, types of operations - Instruction formats- Instruction types

- Processor organization - Register Organization - Instruction cycles -Instruction Pipelining, Hazards, Multiple bus organization, Control unit - Hardwired control unit, Microprogrammed control unit

Unit IV

I/O Organization and Memory Hierarchy: Input/output Systems - Programmed I/O, Interrupt Driven I/O, Direct Memory Access (DMA) Memory Systems: locality of reference principle - Memory Hierarchy Cache memory - Main Memory - Virtual memory -Secondary storage

Unit V

Parallel Organizations: Superscalar Processors - Multiple Processor Organizations - Flynn's Classification, Symmetric Multiprocessors - Non uniform Memory Access - Vector Processor

Text Books

2

Computer Organization

S.N	Title	Authors	Edition	Publisher
1	Computer Organization & Architecture	William stalkings	8 th Edition	Prentice Hall
2	Computer Organization	Carl Hamacher Tata	5 th Edition	McGraw Hill
Referer	nce Books			
S.N	Title	Authors	Edition	Publisher
1	Computer Architecture: A Quantitative	John L. Hennessy,	6 th Edition	Elsevier Science
	Approach	David A. Patterson.		

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5th Edition

J. P. Hayes

[8Hrs]

[7Hrs]

[7Hrs]

[7Hrs]

[7Hrs]

Tata McGraw



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Course Code	Course Name	Th	Tu	Pr	Credits		Evaluation	
						СА	ESE 25	Total
CE302P	Computer Lab- I	-	-	4	2	25		50
Co	ourse Objectives				Course	Outcomes		
 This course is intended To provide under using competitive To enhance the a using competitive 	l standing of basic problem solving programming bility for complex problem solving programming	Stud E C E p	ents w Explore f Basic Explore rogram	ill be a and im progra and im ming	able to applement the amming aplement the	competitive advanced cc	programming	concepts npetitive

Expt. No.	Title of the experiment					
1	To explore the competitive programming examples based on Basic Programming					
2	To explore the competitive programming examples based on Array					
3	To explore the competitive programming examples based on Data Structure					
4	To explore the competitive programming examples based on Strings					
5	To explore the competitive programming examples based on Sorting					
6	To explore the competitive programming examples based on Binary Search					
7	To explore the competitive programming examples based on Maths					
8	To explore the competitive programming examples based on Dynamic Programming					

S.N	Title	Authors	Edition	Publisher
1	Let us C	Yashwant Kanetkar		BPB Publication
2	Python Programming: A Practical	Vijay Kumar Sharma,		
	Approach	VimalKumar,SwatiShar		CRC Press
		ma,ShashwatPathak		

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Course Code	Course Name	Th	Tu	Pr	Credits						
0E 000T	Dete Otmostores						4	4	СА	ESE	Total
CE 3031	Data Structures	4	-	-	4	30	70	100			
	Course Objectives				Cou	rse Outcome	S				
This course is inte	nded	S	tudent	s will b	be able to						
		\bullet	Unde	erstand	I the basic c	oncept of data	a structures, f	ime			
 To provide k and algorithm To choose a design method To efficiently solutions for set 	nowledge of basic concepts in data structu is. the appropriate data structure and algori id for a specified application. implement the different data structures a specific problems	ires thm nd	com algo To ir circu Appl to va Imple solut Dem appli table	plexity rithms. npleme ilar link y the d arious c ement tion. nonstrations ications es for h	and analyse ent dynamic ed list. ifferent linea computing pr different type te the repres s in real life ashing and o	the various s data structure oblems. es of trees an sentation of gr problem and in collision resolu	orting and se is like singly, res like stack d apply them aphs and the nfer the use o ution.	earching doubly and and queue to problem eir of symbol			

Unit I

Introduction: Concept of Data structures, Time and space analysis of algorithms, Big oh and theta notations and omega notations, Average, best and worst case analysis,

Searching and sorting techniques- Linear search, Binary search, Indexed search, Insertion sort, selection sort, Bubble Sort, radix Sort, Merge Sort, Quick Sort.

Unit II

Linked Lists : Singly linked list, Implementation of linked list using static and dynamic memory allocation, operations on linked list, polynomial representations and manipulations are using linked list, circular linked list, doubly linked list, Generalized list, sparse matrix, polynomial

Unit III

[8Hrs]

[7Hrs]

[9Hrs]

[8Hrs]

[8Hrs]

Stack and Queue: Array representation of stacks, Implementation of stack using linked lists, Queues ,Dequeue, Circular queue, Polish notation, Application of stack & queue: Conversion from Infix to Postfix ,Evaluation of postfix expressions, Priority Queues

Unit IV

Trees: Basic Terminology, Basic trees, Binary tree representations, threaded storage representation, binary tree traversals, binary search trees, Application of trees. Preliminary treatment of AVL Trees, B- Trees.

Unit V

Graphs: Definition & terminology, Graph representation: matrix representation of Graph, List of structure, other representation of graphs, Breadth First Search, Depth First Search, Spanning trees, Shortest path algorithm, topological sorting. **Symbol Tables:** static tree tables, dynamic tree tables, hash tables, hash functions, Collision resolution, overflow handling, Applications

S.N	Title	Authors	Edition	Publisher
1	Fundamentals of Data Structure	Horowitz and Sahani		CBS Publications
2	Data Structures using C	Tanenbaum		Pearson Education
3	Data structure and Algorithm	Lafore		BPB Publication
Deferrer	na Baaka			•

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S.N	Title	Authors	Edition	Publisher
1	Data Structure & Programme Design in C	Kruse, Leung, Tondo		PHI
2	Schaum's outline: Date Structures	Seymour Lipschutz		Tata Mc Graw Hill
3	An Introduction to DS with applications	Trembley and sorenson		Mc Graw Hill
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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						_	СА	ESE	Total
CE303P	Data Structures Lab	-	-	4	2	25	25	50	
	Course Objectives				Cours	e Outcomes			
This course is int	ended	Stud	ents w	ill be a	ble to				
 To emphase developing algorithm 	 This course is intended To emphasize the application of data structures in developing and implementing efficient programs and algorithm 			approp n defin lent Lir lent op ing me	priate data s iition near and Nor perations like echanism etc	tructures as a n-Linear data e searching, i c. on various d	applied to spe structures. nsertion, and lata structure	ecified d deletion, s	

Expt. No.	Title of the experiment
1	To design and implement basic C program using arrays & structures
2	To implement a Menu driven program for linear & Binary search methods and demonstrate their constraints.
3	To implement a Menu driven program for Sorting methods and analyze their performances.
4	To implement a Program to demonstrate the working of a stack.
5	To implement a Program to demonstrate the working of a Queue
6	To implement a Program to apply the concepts of linked list
7	To implement the non linear data structure binary tree
8	To implement BFS and DFS in graph

S.N	Title	Authors	Edition	Publisher
1	Data Structure & Programme Design in C	Kruse, Leung, Tondo		PHI
2	Schaum's outline: Date Structures	Seymour Lipschutz		Tata Mc Graw Hill
3	An Introduction to DS with applications	Trembley and sorenson		Mc Graw Hill

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
CE204T	Digital Circuits and Fundamentals	4			4	CA	ESE	Total
CE3041	of Microprocessor	4	-	-	4	30	70	100
	Course Objectives				Cou	rse Outcomes	;	
This course is int	ended	St	tudent	s will b	be able to			
 To acquire to application of circuits. To impart he Understa architecture 	the basic knowledge of digital logic levels and of knowledge to understand digital electronics ow to design Digital Circuits. nd 8086 microprocessor concepts, and programming.	•	rep and OR Del ana ana des mic list, dire pro	resent d will de , NAN Morgar alyze ar alyze ar alyze ar cribe croproce desci ectives gram	numerical emonstrate ND, NOR, n's Theorem nd design di nd design so the arch essor along ribe and u & interrup	values in vari the knowledge XOR, XNOF is, Karnaugh m igital combinati equential digital itecture& org with instruction use different ts and develo	ous number e of: logic ga R), Boolean ap. onal circuits l circuits. ganization n set format. types of in p assembly	of 8086 structions, language

[7Hrs]

Unit I

Number Systems & Code Conversion: Number Systems & Code conversion, Boolean Algebra & Logic Gates, Truth Tables, Universal Gates, Simplification of Boolean functions, SOP and POS methods -Simplification of Boolean functions using Kmaps, Signed and Unsigned Binary Numbers.

Unit II

Combinational Circuits: Combinational Logic Circuits: Adders & Subtractors, Multiplexers, Demultiplexers, Encoders, Decoders, Programmable Logic Devices

Unit III

Sequential Circuits: Sequential Logic Circuits: RS, Clocked RS, D, JK, Master Slave JK, T Flip-Flops, Shift Registers, Types of Shift Registers, Counters, Ripple Counter, Synchronous Counters, Asynchronous Counters, Up-Down Counter.

Unit IV

Fundamentals of 8086 Microprocessors: 8086 microprocessor, Functional Diagram, register organization 8086, Flag register of 8086 and its functions, Addressing modes of 8086, Pin diagram of 8086, Minimum mode & Maximum mode operation of 8086, Interrupts in 8086.

Unit V

Programming of 8086 Micro-processor: Instruction set of 8086, Assembler directives, Procedures and Macros, Simple programs involving arithmetic, logical, branch instructions, Ascending, Descending and Block move programs, String Manipulation Instructions.

Text Books

S.N	Title	Authors	Edition	Publisher
1	Digital Design	M. Morris Mano, Michael D. Ciletti	5 th Edition	Pearson Education
2	Digital Electronics: Principles, Devices and Applications	Anil K. Maini		John Wiley & Sons, Ltd
3	Microprocessor and Microcontrollers	N. Senthil Kumar, M. Saravanan, S Jeevanathan		Oxford Publishers
4	Advanced microprocessors & peripherals	A.K Ray and K.M.Bhurchandani	2 nd Edition	ТМН
Referen	nce Books			
S.N	Title	Authors	Edition	Publisher
1	Digital Fundamentals –A Systems Approach	Thomas L. Floyd		Pearson
2	Fundamentals of Logic Design	Charles H. Roth	5 th Edition	Cengage Learning
3	Microprocessors and Interfacing.	D.V.Hall,	2 nd Edition	TMGH
4	The 8051 microcontroller	Kenneth.J.Ayala	3 rd Edition	Cengage Learning

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[7Hrs]

[7Hrs]

[7Hrs]

[8Hrs]



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Course Code	Course Name	Th	Tu	Pr	Credits		Evaluation	
CE204D	Digital Circuits and Fundamentals of			ſ	4	CA	ESE	Total
CE304P	Microprocessor Lab	-	-	2		25	25	50
	Course Objectives				Cours	e Outcomes		
This course is int	ended	Stud	ents w	ill be a	ble to			
• To introduce the basic concepts and laws involved in • understand the Combinational Circuits using Logic Gates.				Gates.				
the Boolea	n algebra and logic families and digital	•	design	Arithm	etic and Log	gical Circuit		
circuits.			 demonstrate understanding of flip-flops & Sequential circuits . 					
 To familiar 	ize with the different logic gates, and	•	unders	tand th	e Basic Fun	damentals of	8086 Microp	rocessor
combination	nal and sequential circuits utilized in the							
different dig	ital circuits and systems.							
 To introduc 	e basic instruction of microprocessor.							

Expt. No.	Title of the experiment			
1	To verify the truth table of different logic gates.			
2	To study and verify the NAND & NOR gates as universal gates.			
3	To study and verify truth table of Half adder and Full Adder.			
4	To study and verify truth table of Multiplexer & Demultiplxer.			
5	To study and verify truth table of different flip flops.			
6	To study and verify 4 bit ripple counter.			
7	Write and execute an ALP for addition & Subtraction of two 16 bit numbers.			
8	Write and execute an ALP to find 1's complement of 16 bit a number.			
9	9 Write and execute an ALP for sorting of data in ascending order and find Largest number in an array.			
10	Mini -Project			

S.N	Title	Authors	Edition	Publisher
1	Digital Integrated Electronics	Herbert Taub		McGraw Hill.
2	Digital Logic and Computer Design	Morris Mano		PHI
3	Digital Integrated Electronics	Herbert Taub		McGraw Hill
4	Digital Electronics Logic and System	James Bingnell and Robert		
		Donovan,		

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Unit I

Purpose and motivation for the course, recapitulation from Universal Human Values-I ,Self-Exploration-what is it? - Its content and process; 'Natural Acceptance' and Experiential Validation- as the process for self-exploration, Continuous Happiness and Prosperity- A look at basic Human Aspirations , Right understanding, Relationship and Physical Facility- the basic requirements for fulfilment of aspirations of every human being with their correct priority, Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario, Method to fulfil the above human aspirations: understanding and living in harmony at various levels. Unit II

[6Hrs]

[6Hrs]

Understanding human being as a co-existence of the sentient 'I' and the material 'Body', Understanding the needs of Self ('I') and 'Body' - happiness and physical facility, Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer) ,Understanding the characteristics and activities of 'l' and harmony in 'l', Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail, Programs to ensure Sanyam and Health. Unit III [6Hrs]

Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship , Understanding the meaning of Trust; Difference between intention and competence, Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship, Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals, Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.

Unit IV

[6Hrs]

Understanding the harmony in the Nature, Interconnectedness and mutual fulfilment among the four orders of nature- recyclability and self-regulation in nature, Understanding Existence as Co-existence of mutually interacting units in all-pervasive space, Holistic perception of harmony at all levels of existence. Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc. [6Hrs]

Unit V

Natural acceptance of human values, Definitiveness of Ethical Human Conduct, Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order, Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems. Case studies of typical holistic technologies, management models and production systems. Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually enriching institutions and organizations ,Sum up

S.N	Title	Authors	Edition	Publisher
1	Human Values and Professional Ethics	Gaur, Sangal, Bagaria	2010	Excel Books, New Delhi
Referen	nce Books			
S.N	Title	Authors	Edition	Publisher
1	Jeevan Vidya: Ek Parichaya	A Nagaraj	1999	Jeevan Vidya Prakashan, Amarkantak.
2	Human Values	A.N. Tripathi	2004	New Age Intl. Publishers, New Delhi
3	The Story of My Experiments with Truth	M. K Gandhi		

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