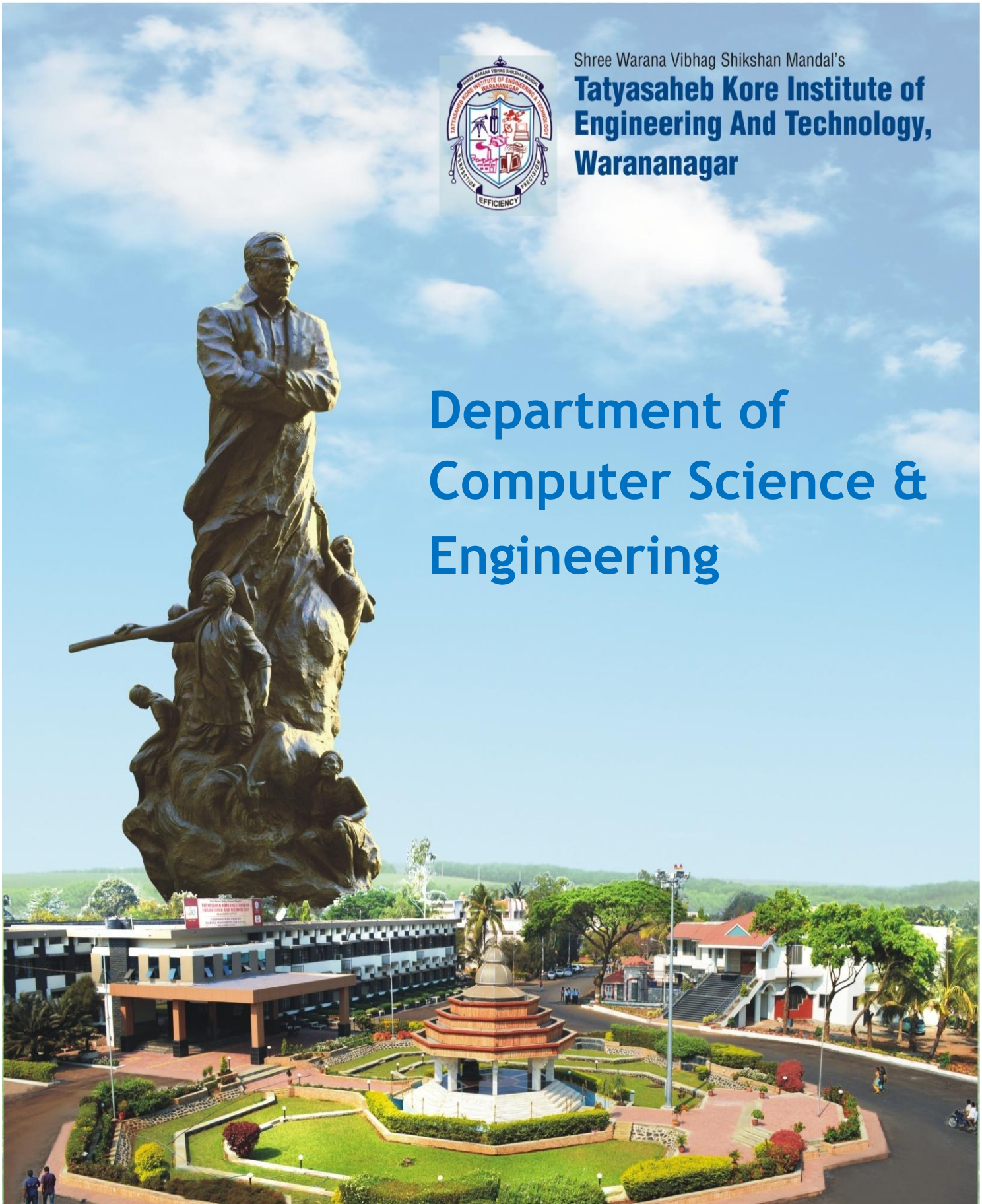
Shree Warana Vibhag Shikshan Mandal's

Tatyasaheb Kore Institute of Engineering & Technology

Warananagar, Tal- Panhala, Dist- Kolhapur -416 113. Maharashtra

An Autonomous Institute, affilated to Shivaji University, Kolhapur



Shree Warana Vibhag Shikshan Mandal's

Tatyasaheb Kore Institute of Engineering And Technology, Warananagar

Department of Computer Science & Engineering

Department of Computer Science & Engineering

Vision

To become center of excellence in the field of Computer Science and Engineering and develop competent IT technocrats

Mission

- To develop engineering graduates with high degree of processional excellence
- To excel in academics and research through contemporary and real world problems
- To enhance graduate employability through work based learning in social entrepreneurship
- To encourage industrial and nationally recognized institutes collaboration
- To create an environment to nurture lifelong learning

Program Educational Objectives (PEOs)

Graduates will be,

- Able to design and develop computing system using modern technologies by adapting business intelligence and challenges.
- Able to acquire capabilities with aptitude for higher education and entrepreneurship
- Able to function effectively as professionals having excellent interpersonal skills with ethical and social obligations.
- Able to work efficiently in multidisciplinary and multicultural environment
- Able to lead in their respective domain and contribute positively to the needs of society.

Program Specific Outcomes (PEOs)

Graduate will be able to

- Identify, design and develop solution for real world problems by implementing phases of software development process model
- Analyze and apply the computer science engineering solutions in societal and human context
- Demonstrate the skills and knowledge of contemporary issues in the field of Computer science and Engineering

Quality Policy

- To promote excellence in academic and training activities by inspiring students for becoming competent professionals to cater industrial and social needs.

Department of Computer Science & Engineering

Program Outcomes (POs)

The students after successfully completing this programme will have ability to:

- **PO1: Engineering Knowledge**:
  Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- **PO2: Problem Analysis**:
  Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO3: Design/Development of Solutions**:
  Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO4: Conduct Investigations of Complex Problems**:
  Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- **PO5: Modern Tool Usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- **PO6: The Engineer and Society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
- **PO7: Environment and Sustainability**:
  Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- **PO8: Ethics**:
  Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **PO9: Individual and Team Work**:
  Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- **PO10: Communication**:
  Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- **PO11: Project Management and Finance**:
  Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **PO12: Life-long learning**:
  Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Department of Computer Science & Engineering

Abbreviations

Sr. No.	Acronym	Definition
1	ISE	In-Semester Examination
2	ISE-I	In-Semester Examination-I
3	ISE-II	In-Semester Examination-II
4	ESE	End Semester Examination
5	ISA	In-Semester Assessment (Term Work)
6	L	Lecture
7	T	Tutorial
8	P	Practical
9	CH	Contact Hours
10	C	Credit

Course Categories

Sr. No.	Acronym	Definition
1	BSC	Basic Science Course
2	HSC	Humanity Science Course
3	ESC	Engineering Science Course
4	PCC	Professional Core Course
5	OEC	Open Elective Course
6	MC	Mandatory Course
7	PEC	Professional Elective Course
8	PW	Project Work (Mini and Major Project)
9	II	Industrial Internship

Course/ Subject Code

C	S	E	3	0	1
Branch Code			Semester	Course Number	

Course Term work and POE Code

C	S	E	3	0	1	T / P / A
Branch Code			Semester	Course Number		T- Term work P- POE A- Audit Course

Second Year B. Tech.

in

Computer Science & Engineering

Syllabus Structure under Autonomous Status of TKIET, Warananagar

Second Year B. Tech. (Computer Science & Engineering)

Semester-III

(To be implemented from 2021 - 22)

Credit Scheme

Course Code	Category	Course Title	Teaching and Credit Scheme					Examination & Evaluation Scheme		
			L	T	P	CH	C	Component	Marks	Min for Passing
CSE301	BSC	Mathematics for Computer Science	3	--	--	3	3	ESE	60	24
								ISE	40	---
CSE302	PCC	Discrete Mathematical structures	3	--	--	3	3	ESE	60	24
								ISE	40	---
CSE303	PCC	Data Structures	3	--	--	3	3	ESE	60	24
								ISE	40	---
CSE304	PCC	Data Communication and Networks	3	--	--	3	3	ESE	60	24
								ISE	40	---
CSE305	PCC	Digital Systems & Microprocessors	3	--	--	3	3	ESE	60	24
								ISE	40	---
CSE301T	PCC	Mathematics for Computer Science Tutorial	--	1	--	1	1	ISA	25	10
CSE302T	PCC	Discrete Mathematical structures Tutorial	--	1	--	1	1	ISA	25	10
CSE303P	PCC	Data Structures Lab	--	--	2	2	1	ESE	50	20
								ISA	50	20
CSE305P	PCC	Digital systems & Microprocessors lab	--	--	2	2	1	ESE	25	20
								ISA	25	10
CSE306P	PCC	Problem Solving using C Programming	2	--	2	4	3	ESE	50	20
								ISA	50	20
CSE307A	AC	Audit Course III : Environmental Studies	2	--	--	2	--	ESE	--	--
								ISA	--	--
TOTAL			19	2	6	27	22	--	800	---

Department of Computer Science & Engineering

Guidelines for Course conduction and Evaluation in S.Y.B.Tech.(CSE) Sem- III & Sem IV

1. A Moodle course structure is created for each course in the curriculum.
2. All the course teachers will upload course material, activities and assignments on moodle
3. All the students will be given a separate login credential on Moodle to access the contents in it.
4. The term work (ISA) will be assessed and evaluated as per the criteria defined in course contents.
5. ISE – I & ISE – II will of 40 Marks each: Average of Two ISEs will be considered to qualify.
6. **Minimum marks required to qualify for ISE : 16 out of 40 marks**
7. **Minimum marks required to qualify for TW: 10 out of 25 marks**
8. **Minimum marks required to qualify for TW: 20 out of 50 marks**
9. Completions of Audit Course activities are mandatory.

End Semester Examination (ESE- Theory):

1.	It will be conducted for 60 marks having 2 hours duration.
2.	Each Topic should have equal weightage.
4.	Theory Paper should contain the Theoretical as well as analytical questions.
5.	Minimum passing marks to be scored in ESE-T: 24 out of 60 marks

Second Year B. Tech.
in
Computer Science & Engineering

Third (III) Semester Detailed Syllabus

Second Year B. Tech(CSE) (Semester – III)
CSE301: Mathematics for Computer Science

Teaching Scheme	Credits :	Examination Scheme
Lectures: 03 Hrs / Week	03	**ESE:** 60 Marks **ISE:** 40 Marks

Course Description:

Mathematics for Computer science course is offered as the basic science course. This course contains statistical methods and techniques that are typically used in Computer science engineering to solve complex engineering problems. This course has six units namely i) Introduction to Statistics ii) Correlation, Regression & Curve Fitting, iii) Probability Distribution, iv) Statistical Inference-Test of Hypothesis, v) Introduction to Fuzzy sets, vi) Numerical Methods and Number series.

Prerequisites:	**1.** Basic Mathematics

Course Objectives:

1. To develop mathematical skills and enhance analytical power of students.
2. To prepare students to analyze data using statistical methods & interpret the solution in realworld.
3. To give the knowledge to the students of fuzzy set theory and Numerical methods.

Course Outcomes:

COs	At the end of successful completion of the course the student will beable to	Blooms Taxonomy
CO1	Describe and interpret the statistical data numerically by using statistical methods.	Analyze
CO2	Solve basic problems in probability theory, including problems involving the binomial, Poisson, and normal distributions.	Apply
CO3	Define fuzzy sets using linguistic words and represent these sets by membership functions, convexity, Normality, support, etc.	Understand
CO4	Find roots of algebraic and transcendental equations using numerical methods.	Understand

Course Contents

Unit-I	Introduction to Statistics	08 Hours

Revision of basic definitions/concepts ,Measures of central tendency: Arithmetic Mean (A.M.), Median, Mode, Combined Mean, Measures of Dispersion :Range, Quartile deviation, Mean deviation Standard deviation as Absolute measures of dispersion, Coefficient of range, quartile deviation, mean deviation, Coefficient of variation as Relative measures of dispersion

Unit-II	Correlation, Regression & Curve Fitting	08 Hours

Introduction , Karl Pearson's Coefficient of Correlation, Lines of regression of bi-variate data, Fitting of Curves by method of Least-squares: Fitting of Straight lines, Fitting of exponential curves, Fitting of second degree Parabolic curves

Unit-III	Probability Distribution	07 Hours

Random variables, Discrete Probability distribution, Continuous probability distribution , Binomial Distribution, Poisson Distribution, Normal Distribution.

Unit-IV	Statistical Inference-Test of Hypothesis	05 Hours

Introduction, Null Hypothesis, Alternate Hypothesis, Statistic, Critical Region, Errors in testing, Level of Significance, Test for population mean, equality of population means population proportion & equality of population proportions, Test of significance for small samples: t- test, Chi- Square test Test of significance for large samples.

Unit-V	Introduction to Fuzzy sets	07 Hours
Introduction, Definition of Fuzzy set, Membership function, Difference between Crisp set and Fuzzy set, Basic concepts of fuzzy sets, Basic operations on fuzzy sets, Properties of fuzzy sets.		
Unit-VI	**Numerical Methods and Number series**	**07 Hours**
Numerical solution of algebraic and transcendental equations: Bisection Method, Newton Raphson Method, Secant Method Number Series revision : Arithmetic Series , Geometric series & Harmonic Series		

Course delivery methods	Assessment methods
1. Black Board Teaching 2. Power Point Presentation	1. Internal Assessment 2. Assignment, Tutorial 3. Quiz

Text Books:

1. Higher Engineering Mathematics by Dr. B. S. Grewal, Khanna Publishers, Delhi.
2. A text book of Engineering Mathematics by N. P. Bali, Iyengar, Laxmi Publications (P) Ltd., New Delhi.

Reference Books:

1. *"Statistical Methods"* by S. P. Gupta, Paperback Publication.
2. *"Numerical methods"* by Dr. B. S. Grewal, Khanna Publishers, Delhi,
3. *"Advanced Engineering Mathematics"* by Erwin Kreyszig, Wiley India Pvt. Ltd.
4. *"Probability and Statistics"* - John Schiller, Murray R. Spigel (MGH), Schaum's outlines.
5. *"Fuzzy Sets and Fuzzy Logic: Theory and Applications"*, by George J. Klir and Bo Yuan (Prentice Hall of India Private Limited).

Text Books:

1. *"Higher Engineering Mathematics "by* Dr. B. S. Grewal, Khanna Publishers, Delhi.
2. "*A text book of Engineering Mathematics*" by N. P. Bali, Iyengar, Laxmi Publications (P) Ltd., NewDelhi.

Reference Books:

1. "*Statistical Methods*" by S. P. Gupta, Paperback Publication.
2. *"Numerical methods"* by Dr. B. S. Grewal, Khanna Publishers, Delhi,
3. *"Advanced Engineering Mathematics"* by Erwin Kreyszig, Wiley India Pvt. Ltd.
4. *"Probability and Statistics"*- John Schiller, Murray R. Spigel (MGH), Schaum's outlines.
5. *"Fuzzy Sets and Fuzzy Logic: Theory and Applications"*, by George J. Klir and Bo Yuan (Prentice Hall of India Private Limited).

CO-PO Mapping:

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	--	1	1	--	--	--	--	--	--	1
CO2	3	2	--	1	--	--	--	--	--	--	--	1
CO3	3	1	--	--	--	--	--	--	--	--	--	--
CO4	3	--	--	1	--	--	--	--	--	--	--	--

1-Low, 2-Medium, 3-High

Syllabus Setting Committee:

Sr. No.	Name of the faculty	Email-Id	Mobile
1	Dr. D. N. Mane	dn_mane@tkietwarana.ac.in	9657847636
2	Prof. D. S. Mane	dhanaji_mane@tkietwarana.ac.in	9420674756
3	Prof. S. N. Shelake	snshelake@tkietwarana.ac.in	9890695220

TATYASAHEB KORE INSTITUTE OF ENGINEERING & TECHNOLOGY Autonomous Warananagar

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Second Year B. Tech(CSE) (Semester – III)
CSE301T: Mathematics for Computer Science Tutorial

Teaching Scheme	Credits :	Examination Scheme
Tutorial: 01 hrs / Week	01	**ISA** –25 Marks

Course Description:

Mathematics for Computer science course is offered as the basic science course. This course contains statistical methods and techniques that are typically used in Computer science engineering to solve complex engineering problems. This course has six units namely i) Introduction to Statistics ii) Correlation, Regression & Curve Fitting, iii) Probability Distribution, iv) Statistical Inference-Test of Hypothesis, v) Introduction to Fuzzy sets, vi) Numerical Methods and Number series.

Prerequisites:	1. Basic Mathematics

Course Objectives:

1. To develop mathematical skills and enhance analytical power of students.
2. To prepare students to analyze data using statistical methods & interpret the solution in real world.
3. To give the knowledge to the students of fuzzy set theory and Numerical methods.

Course Outcomes:

COs	At the end of successful completion of the course the student will be able to	Blooms Taxonomy
CO1	Describe and interpret the statistical data numerically by using statistical methods.	Analyze
CO2	Solve basic problems in probability theory, including problems involving the binomial, Poisson, and normal distributions.	Apply
CO3	Define fuzzy sets using linguistic words and represent these sets by membership functions, convexity, Normality, support, etc.	Understand
CO4	Find roots of algebraic and transcendental equations using numerical methods.	Understand

Course Contents

ISA Assignments:

ISA (Term-Work) will consist of Assignments /tutorials covering entire syllabus.
Total number of Assignments six covering entire syllabus

Sr. No	Tutorial Assignments
1	Measures of Central tendencies
2	Measures of Dispersion
3	Lines of Regression
4	Curve Fitting
5	Binomial Distribution
6	Poisson Distribution & Normal Distribution
7	Test of hypothesis for large and Small samples
8	Algebra of fuzzy set
9	Properties of fuzzy set
10	Bisection Method, Newton Raphson Method & Secant Method

ISA (Term Work) Evaluation:

The ISA (term work) will be assessed and evaluated based on performance of students in various activities conducted in tutorial sessions. The distribution for ISA (term work) marks shall be as follows(For 25 marks):				
Timely performance and submission of assignments	Attendance	Journal	Quizzes/Activities/Presentations /VLABS/Problem Solving etc.	Oral Performance
5 Marks	**5 Marks**	**5 Marks**	**5 Marks**	**5 Marks**

Minimum marks required to qualify for ISA: 10 out of 25 marks

Text Books:

1. *"Higher Engineering Mathematics"* by Dr. B. S. Grewal, Khanna Publishers, Delhi.
2. *"A text book of Engineering Mathematics"* by N. P. Bali, Iyengar, Laxmi Publications (P) Ltd., NewDelhi.

Reference Books:

1. *"Statistical Methods"* by S. P. Gupta, Paperback Publication.
2. *"Numerical methods"* by Dr. B. S. Grewal, Khanna Publishers, Delhi,
3. *"Advanced Engineering Mathematics"* by Erwin Kreyszig, Wiley India Pvt. Ltd.
4. *"Probability and Statistics"*- John Schiller, Murray R. Spigel (MGH), Schaum's outlines.
5. *"Fuzzy Sets and Fuzzy Logic: Theory and Applications"*, by George J. Klir and Bo Yuan (Prentice Hall of India Private Limited).

CO-PO Mapping:

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	--	1	1	--	--	--	--	--	--	1
CO2	3	2	--	1	--	--	--	--	--	--	--	1
CO3	3	1	--	--	--	--	--	--	--	--	--	--
CO4	3	--	--	1	--	--	--	--	--	--	--	--

1-Low, 2-Medium, 3-High

Syllabus Setting Committee:

Sr. No.	Name of the faculty	Email-Id	Mobile
1	Dr. D. N. Mane	dn_mane@tkietwarana.ac.in	9657847636
2	Prof. D. S. Mane	dhanaji_mane@tkietwarana.ac.in	9420674756
3	Prof. S. N. Shelake	snshelake@tkietwarana.ac.in	9890695220

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Second Year B. Tech(CSE) (Semester – III)
CSE302: Discrete Mathematical Structure

Teaching Scheme	Credits :	Examination Scheme
Lectures: 03 Hrs / Week	03	**ESE:** 60 Marks **ISE:** 40 Marks

Course Description:

This course covers elementary discrete mathematics for computer science and engineering.
It emphasizes mathematical definitions and proofs as well as applicable methods. This course teaches the students how to think logically and mathematically and apply these techniques in solving computer science problems.

Prerequisites:	Basic Mathematics

Course Objectives:

1. To expose the students to the mathematical logic related to computer science areas.
2. To enhance the problem solving skills in the areas of theoretical computer science.
3. To use mathematical concepts in the development of computer applications.

Course Outcomes:

COs	At the end of successful completion of the course the student will be able to	Blooms Taxonomy
CO1	Define the concepts of propositional logic, set theory and graph theory.	Understand
CO2	Classify relations, functions, lattice and algebraic systems based on their properties.	Understand
CO3	Apply the basic concepts of Sets, Boolean algebra and Graphs to represent structures, logic design in digital computer and to solve basic computer science problems respectively.	Apply

Course Contents

Unit-I	Mathematical Logic	08 Hours
Statements & Notations, Connectives, Well formed formulas & Tautologies, Equivalence of formulas & Duality law, Tautological Implications, Other Connectives, Predicate Calculus		
Unit-II	**Set Theory**	**04 Hours**
Basic concepts of set theory, Operations on Sets, Venn Diagrams, Ordered pairs & n-tuples, Cartesian product		
Unit-III	**Relations & Functions**	**08 Hours**
Relations, Properties of binary relations, Representation of relation , Equivalence Relations, Composition of Binary Relation, POSET & Hasse Diagram, Functions, Types of Functions		
Unit-IV	**Algebraic Systems**	**05 Hours**
Algebraic Systems: Examples & general properties., Semigroups & Monoids, Groups: Definitions & Examples, Subgroup & Homomorphism		
Unit-V	**Lattice and Boolean Algebra**	**07 Hours**
Lattice as partially ordered sets, Lattice as Algebraic Systems, Special Lattices, Boolean Algebra: Definitions & examples, Boolean Functions, Representation & Minimization of Boolean Functions.		

Unit-VI	Graph Theory	07 Hours
Basic concepts of graph theory, Paths, Reachability & Connectedness, Matrix Representations of Graphs, Storage Representation & Manipulations of Graphs, PERT & Related technologies.		

Text Book:

1. *"Discrete Mathematical Structures with Application to Computer Science"* by J. P. Tremblay & R. Manohar (MGH International).
2. *"Elements of Discrete Mathematics"* by C .L. Liu & D. P. Mohapatra (SIE Edition) TATA-McGraw Hill
3. *"Discrete Mathematics and its Applications"* - Kenneth H. Rosen (AT&T Bell Labs) (mhhe.com/Rosen)

Reference Books:

1. *"Discrete Mathematics"* - Semyour Lipschutz, Marc Lipson (MGH), Schaum's outlines.
2. *"Discrete Mathematical Structures"* – Bernard Kolman, Robert Busby, S. C. Ross and Nadeemur-Rehman (Pearson Education)

CO-PO Mapping:

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	--	1	--	--	--	--	--	--	--	1
CO2	3	--	--	--	--	--	--	--	--	--	--	1
CO3	3	--	--	1	1	--	--	--	--	--	1	1

1-Low, 2-Medium, 3-High

Syllabus Setting Committee:

Sr. No.	Name of the faculty	Email-Id	Mobile
1	Prof. R. B. Patil	rbpatil@tkietwarana.ac.in	9975419483
2	Prof. A. T. Sonale	atsonale@tkietwarana.ac.in	9552214195
3	Prof. M. S. Bhosale	msbhosale@tkietwarana.ac.in	9766362070

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Second Year B. Tech(CSE) (Semester – III)
CSE302T: Discrete Mathematical Structure

Teaching Scheme	Credits :	Examination Scheme
Tutorial : 01 Hrs/Week	01	**ISA :** 25 Marks

Course Description:

This course covers elementary discrete mathematics for computer science and engineering. It emphasizes mathematical definitions and proofs as well as applicable methods. This course teaches the students how to think logically and mathematically and apply these techniques in solving computer science problems.

Prerequisites:	Basic Mathematics

Course Objectives:

1. To expose the students to the mathematical logic related to computer science areas.
2. To enhance the problem solving skills in the areas of theoretical computer science.
3. To use mathematical concepts in the development of computer applications.

Course Outcomes:

COs	At the end of successful completion of the course the student will be able to	Blooms Taxonomy
CO1	Define the concepts of propositional logic, set theory and graph theory.	Understand
CO2	Classify relations, functions, lattice and algebraic systems based on their properties.	Understand
CO3	Apply the basic concepts of Sets, Boolean algebra and Graphs to represent structures, logic design in digital computer and to solve basic computer science problems respectively.	Apply

Course Contents

Term Work Assignments:

Students must complete following assignments based on above topics.

1. Statement formulas & Well formed formula
2. Equivalence of formulas & Tautological Implications
3. Set theory concepts & Set Operations
4. Relation concepts & Properties of Relations
5. POSET & Functions
6. Algebraic Systems & it's Types
7. Lattices & examples
8. Boolean Algebra & Boolean Function
9. Graph Concepts & Matrix Representation
10. Storage Representation & Applications of graph

Course delivery methods	Assessment methods
1. Black Board Teaching 2. Power Point Presentation	1. Internal Assessment 2. Assignment 3. Quiz

ISA (Term Work) Evaluation:

The term work will be assessed and evaluated based on performance of students in various activities conducted in tutorial sessions.
The distribution for ISA (term work) marks shall be as follows(For 25 marks):

Timely performance and submission of assignments	Attendance	Journal	Quizzes/Activities/Presentations /VLABS/Problem Solving etc.	Oral Performance
5 Marks	**5 Marks**	**5 Marks**	**5 Marks**	**5 Marks**

Minimum marks required to qualify for ISA: 10 out of 25 marks

Text Book:

1. *"Discrete Mathematical Structures with Application to Computer Science"* by J. P. Tremblay & R. Manohar (MGH International).
2. *"Elements of Discrete Mathematics"* by C .L. Liu & D. P. Mohapatra (SIE Edition) TATA-McGraw Hill
3. *"Discrete Mathematics and its Applications"* - Kenneth H. Rosen (AT&T Bell Labs) (mhhe.com/Rosen)

Reference Books:

1. *"Discrete Mathematics"* - Semyour Lipschutz, Marc Lipson (MGH), Schaum's outlines.
2. *"Discrete Mathematical Structures"* – Bernard Kolman, Robert Busby, S. C. Ross and Nadeemur-Rehman (Pearson Education)

CO-PO Mapping:

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	--	1	--	--	--	--	--	--	--	1
CO2	3	--	--	--	--	--	--	--	--	--	--	1
CO3	3	--	--	1	1	--	--	--	--	--	1	1

1-Low, 2-Medium, 3-High

Syllabus Setting Committee:

Sr. No.	Name of the faculty	Email-Id	Mobile
1	Prof. R. B. Patil	rbpatil@tkietwarana.ac.in	9975419483
2	Prof. A. T. Sonale	atsonale@tkietwarana.ac.in	9552214195
3	Prof. M. S. Bhosale	msbhosale@tkietwarana.ac.in	9766362070

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Second Year B. Tech(CSE) (Semester – III)

CSE303 : Data Structures

Teaching Scheme	Credits :	Examination Scheme
Lectures: 03 Hrs / Week	03	**ESE:** 60 Marks **ISE:** 40 Marks

Course Description:

The course is designed to develop skills to design and analyze simple linear and non linear data structures. It strengthen the ability to the students to identify and apply the suitable data structure for the given real world problem. It enables them to gain knowledge in practical applications of data structures

Prerequisites:	1. Basic Knowledge of C 2. Basic mathematical Approach

Course Objectives:

1. To make the students familiar with basic data structures.
2. To provide students with foundation in computer programming/problem solving.
3. To enable the students to select appropriate data structures in computer applications.
4. To provide the detail of implementation of various data structures

Course Outcomes:

COs	At the end of successful completion of the course the student will beable to	Blooms Taxonomy
CO1	Identify the appropriate data structure for specific application	Remember
CO2	Identify the appropriate sorting and searching algorithms for a given problem size/datasets	Understand
CO3	Outline the solution to the given software problem with appropriate data structure.	Analyze

Course Contents

Unit-I	Basic of Data Structures	04 Hours

Data structure- Definition, Primitive and Non-Primitive data structures, Operations, Analysis of Algorithms: Definition, characteristics of algorithms, Asymptotic notations Complexities and examples

Unit-II	Searching and Sorting Techniques	08 Hours

Searching Techniques: Linear search, Binary search, complexity comparisons and Analysis.
Hashing – Definition, Type of hash functions, Collision, introduction to Collision Resolution Techniques
Sorting Techniques: Bubble sort, Selection sort, Insertion sort, Merge sort, Quick sort, Radix sort, Complexity and analysis.

Unit-III	Linear Data Structures	07 Hours

Stack: Definition, operations, Array representation of stack, Applications of Stack Queue: Definition, operations, Array representation of queues, Types of Queue - Circular queue, Priority queue, Double Ended Queue, Applications of Queue.

Unit-IV	Linked Lists	07 Hours
Definition, Terminology representation, Types of Linked Lists, Operations, implementation and applications of singly, doubly and circular linked lists. Linked representation of stack and Queue.		
Unit-V	**Trees**	**06 Hours**
Definition, Tree Terminology, Static And Dynamic Representation, Binary tree, Types of Binary Tree, Binary Tree traversals, Binary search tree, AVL search tree, Red-Black tree, Heaps- Operations and their applications, Heap sort.		
Unit-VI	**Graphs**	**06 Hours**
Basic concept of graph theory, Terminology and Applications, Types of Graphs, Representation of graphs using Adjacency matrix and Adjacency list , graph traversal techniques- BFS and DFS, Graph representation using sparse matrix.		

Course delivery methods	Assessment methods
1. Black Board Teaching 2. Power Point Presentation	1. Internal Assessment 2. Experiments 3. Quiz

Text Book:

1. *"Schaum's Outlines Data Structures"* – Seymour Lipschutz (MGH)

Reference Books:

1. *"Data Structure using C"* - A. M. Tanenbaum, Y. Langsam, M. J. Augenstein (PHI)
2. *"Data Structures- A Pseudo code Approach with C"* – Richard F. Gilberg and Behrouz A. Forouzon, 2nd Edition
3. *"Data Structures through C"* -Yashvant P Kanetkar, BPB Publication

CO-PO Mapping:

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	--	--	--	--	--	1	--	2
CO2	3	3	1	1	--	--	--	--	--	1	--	2
CO3	3	2	3	2	--	--	--	1	--	1	2	2

1-Low, 2-Medium, 3-High

Syllabus Setting Committee:

Sr. No.	Name of the faculty	Email-Id	Mobile
1	Prof. K. K. Awale	kiran_awale@tkietwarana.ac.in	8793453354
2	Prof. Sachin Urabinahatti	saurabinahatti@tkietwarana.ac.in	98379951800
3	Prof. S. S. Matsagar	ssmatsagar@tkietwarana.ac.in	8421507130

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Second Year B. Tech(CSE) (Semester – III)
CSE304: Data Communication and Networks

Teaching Scheme	Credits :	Examination Scheme
Lectures: 03 Hrs / Week	03	**ESE:** 60 Marks **ISE:** 40 Marks

Course Description:

This Course is designed to understand the fundamentals of Data Communication and Network concepts.

Prerequisites:	Basic knowledge of Communication system.

Course Objectives:

1. To understand the basic functionality of devices used in communication system.
2. To understand the protocols and their working as per the changing needs.
3. To implement various algorithms on different layers such as OSI and TCP/IP.

Course Outcomes:

COs	At the end of successful completion of the course the student will be able to	Blooms Taxonomy
CO1	Explain the basic concepts, components of data communication System and Transmission Media.	Remember
CO2	Describe the basis and structure of an abstract layered protocol model and Network topologies.	Remember
CO3	Understand the usability of different protocols and Standards.	Understand
CO4	Understand and apply the skills of subnetting and routing mechanisms.	Apply

Course Contents

Unit-I	Data Communication and Networking Overview	05 Hours

Communication model, Data Communication and Networking-Types of Network and Topology, Network Devices:-Hub, Switch, Bridge, Router, Repeater, Modem, NIC etc.

Unit-II	Data Transmission	05 Hours

Concepts and terminology, Analog and Digital Data Transmission, Transmission Impairments, Channel Capacity, Guided Transmission Media and Wireless Transmission.

Unit-III	Protocol Architecture Model	05 Hours

Protocol Layers, Hierarchy, Layered Architecture, Overview of OSI Model, Overview of TCP/IP Model, Comparison between OSI and TCP/IP Protocol suite, Addressing:- Unicast, Multicast and Broadcast

Unit-IV	Data Link Layer	08 Hours

Design issues for Data Link Layer, Farming Methods:- Bit, Byte and Character Stuffing, Error Detection Methods:- CRC and Checksum. Error Correction Method:-Hamming Code, Flow Control Noisy and Noiseless Protocols:-Stop and Wait, Sliding Window, Go Back N, Selective Repeat

Unit-V	Medium Access Control Sub-layer	05 Hours

Channel allocation problem, Multiple Access Protocols: CSMA/CD,CSMA/CA, Collision free protocols, Ethernet Standards:- IEEE 802.3 & 802.11

Unit-VI	Network Layer	08 Hours

Network layer services, Addressing :- Classful Addressing/ Classless Addressing, IP packet format, Routing Algorithms:- Shortest path routing,, Distance Vector routing, Link state routing, Flooding, Introduction to ARP, RARP, ICMP,IGMP

Course Delivery Method	Course Assessment Method
• Chalk and board • Presentation Slides • Pre recorded Video lectures/Animations • Use of VLAB/MOOC/NPTEL/FOSSEE etc	• Internal assessment • Problem Solving • Topic wise Quizzes

Text Book:

1. *"Data Communications and Networking"* - Behrouz A Forouzan (The McGraw Hill) (Unit 2,3,4,5)
2. *"Computer Networks"* - Andrew S. Tanenbaum- (Prentice Hall) 5th Edition (Unit 1, 6)

Reference Books:

1. *"Data & computer communications"*: - William Stallings (Pearson Education).
2. *"Data communication and computer Networks"* Ajit Pal (PHI Learning)

CO-PO Mapping:

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	--	--	1	--	1	--	--	1	1
CO2	2	3	1	--	--	--	--	1	--	--	--	--
CO3	2	1	--	--	2	--	--	1	--	--	--	--
CO4	2	3	2	2	2	--	--	1	--	--	--	1

1-Low, 2-Medium, 3-High

Syllabus Setting Committee:

Sr. No.	Name of the faculty	Email-Id	Mobile
1	Prof. A. G. Patil	amol_patil@tkietwarana.ac.in	9822558270
2	Prof. S. R. Shetake	sandip_shetake@tkietwarana.ac.in	7385692497

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Second Year B. Tech(CSE) (Semester – III)
CSE305: Digital System and Microprocessor

Teaching Scheme	Credits	Examination Scheme
Lectures : 03 Hrs / Week	03	**ESE:** 60 Marks **ISE:** 40 Marks

Course Description:

This Course is designed to realize the standard building blocks of digital system and microprocessor for Second Year B. Tech students

Prerequisites:	1. Fundamentals of Computers. 2. Computer Programming using C , Subject code FYESC107

Course Objectives:

1. To study and perform arithmetic operations on number system.
2. Introduce the basics of Minimizing Boolean functions by using various techniques like K-Map method and implement by using suitable Logic gates and MSI chips.
3. To understand the functionality and design of Combinational and Circuits.
4. To understand the operation and design of different counters and registers.
5. To overview of microcomputer System and Programming Model of 8086 microprocessors.
6. To write and execute the assembly language programs using 8086 Instruction sets.

Course Outcomes:

COs	At the end of successful completion of the course the student will be able to	Blooms Taxonomy
CO1	Realize the combinational logic circuits by using various logical blocks	Understand
CO2	Understand the architecture of the 8086 processor and to use the tools for programming	Remember & Understand
CO3	Apply different simplification tools for Boolean functions and design the logic circuits.	Apply
CO4	Apply the assembly language programmes to develop and execute the different application.	Apply

Course Contents

Unit-I	Number System and Logic Circuits	06 Hours

Number Conversion & Codes: Binary to Decimal, Decimal to Binary, Octal Number System, Hexadecimal Number System, Binary Codes, and Alphanumeric Codes. **Logic Circuits:** Truth Tables, OR Operation with OR Gate, AND Operation with AND Gate, NOT Gate, Describing, Evaluation & Implementing of Logic Circuits Algebraically, Boolean Theorems, De-Morgan's Theorems

Unit-II	Combinational Logic Circuits and Flip Flops	06 Hours

Combinational logic Circuits: Sum of Product forms, Algebraic Simplification, Karnaugh Map Method, Exclusive-OR, Parity Generator and Checker. **Flip-Flops:** Introduction, Digital Pulses, Clocked Signals& Clocked Flip Flops, Clocked S-R Flip Flops, Clocked J-K Flip Flops, Clocked D Flip Flops, D-Latch.

Unit-III	Digital Arithmetic, Counters and Registers	06 Hours
Digital Arithmetic: Binary Addition, Representing Signed Numbers, Addition in 2'S Compliment System, Subtraction in 2'S Compliment System, Multiplication of Binary numbers, Binary Division, BCD Addition, Hexadecimal Arithmetic. **Counters and Registers:** Introduction, Registers, Shift Registers, Ripple Counters (from Morris Mano Book)		
Unit-IV	**Microcomputers and 8086 Microprocessor**	**07 Hours**
Overview of Microcomputers System: Hardware, Software, Address, General Operation of Computers 8086 Architecture: CPU Architecture, Internal operations. Programming Model of Microprocessor, Real Mode Memory		
Unit-V	**8086 Assembly language Programming-I**	**07 Hours**
Assemble Instruction Format, Assembler: Introduction to Assembler and Assembler Directives, Data Transfer Instructions, Arithmetic Instructions, Branch Instructions		
Unit-VI	**8086 Assembly language Programming-II**	**07 Hours**
Loop Instructions, NOP and HLT Instructions, Flag manipulation instructions, Logical, Shift and Rotate Instructions, Byte and String Manipulations: String Instructions and REP Instructions.		

Course delivery methods	Assessment methods
1. Black Board Teaching 2. Power Point Presentation	1. Internal Assessment 2. Assignment 3. Quiz

Text Books	
1	*"Digital System, Principles and Applications"*: Ronal Tocci, Neal Widmer, Gregory Moss (Pearson Education) 10th Edition for 1st to 3rd Chapters
2	*"Microcomputer Systems, The 8086/8088 Family Architecture, Programming and Design"* by Yu-Cheng Liu Glenn A Gibson for 4th to 6th Chapters
Reference Books	
1	*"Digital Logic and Computer Design"* by M. Morris Mano
2	THE INTEL MICROPROCESSORS 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, Pentium Pro Processor, Pentium II, Pentium III, Pentium 4, and Core2 with 64-Bit Extensions Architecture, Programming, and Interfacing Eighth Edition BARRY B. BREY

CO-PO Mapping:

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	--	1	--	--	--	--	--	1	--	--	1
CO2	2	2	--	2	2	--	--	--	--	--	--	1
CO3	2	3	2	1	2	--	--	--	--	--	--	1
CO4	2	3	2	--	1	--	--	--	2	--	--	2

1-Low, 2-Medium, 3-High

Syllabus Setting Committee:

Sr. No.	Name of the faculty	Email-Id	Mobile
1	Prof. A. S. Phalle	asphalle@tkietwarana.ac.in	8888843820
2	Prof. Mrs. B. A. Chougule	bsmagadum@tkietwarana.ac.in	8698248242

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Second Year B. Tech(CSE) (Semester – III)

CSE306P: Problem Solving Using C Programming

Teaching Scheme	Credits :	Examination Scheme
Lectures: 02 Hrs / Week	02	**ESE:** 50 Marks
Practical: 02 Hrs / Week		**ISA :** 50 Marks

Course Description:

This Course is designed to build problem solving ability and programming Skills in Students

Prerequisites: 1. Computational Mathematics.

Course Objectives:

1. To understand the various steps in program development.
2. To learn the syntax and semantics of C programming language.
3. To learn the usage of structured programming approach in solving problems.

Course Outcomes:

COs	At the end of successful completion of the course the student will be able to	Blooms Taxonomy
CO1	To code and test a given logic in C programming language.	Understand
CO2	To use arrays and strings to write C programs.	Design/Develop
CO3	To decompose a problem into functions and to develop modular Reusable code.	Analyze/Develop
CO4	To use pointers, structures and Unions to write C programs	Design/Develop
CO5	Understand the computer problems and implement the algorithm.	Understand / Develop

Course Contents

Unit-I	Computer Problem Solving	04 Hours

Problem Solving :Introduction, The Problem Solving Aspect, Top Down design, Implementation of Algorithm, Program Verification, The Efficiency of Algorithm

Programming Basics: Variables and Constants, Operators, Conditional Statements, Loops

Arrays: Array notation and representation, manipulating array elements, using multi-dimensional arrays, Problems based on Arrays

Unit-II	The Pre-processor and Functions	04 Hours

Pre-processor: The Pre-processor, #define, #error, Conditional Compilation Directives

Functions: Introduction, types of functions, functions with array, passing parameters to functions, call by value, recursive functions, Storage Classes, Problems based on Functions

Unit-III	Pointers	06 Hours

Pointers: What Are Pointers, Pointer Variables, The Pointer Operators, Pointer Expressions, Pointer Assignments, Pointer Conversions, Pointer Arithmetic, Pointer Comparisons, Pointers and Arrays, Multiple Indirection, C's Dynamic Allocation Functions, Problems with Pointers, Passing Array to Function, Call by Reference.

Unit-IV	Strings	04 Hours

Strings: Declaring and initializing string variables, reading string from terminal, writing string to screen, arithmetic operations on characters, putting strings together, string handling functions.

Unit-V	Structures, Unions, Enumerations, and typedef	04 Hours
Structure definition, Accessing Structure Members, Structure Assignments, Arrays of Structures, Passing Structures to Functions, Structure Pointers, Unions, Enumerations, typedef		
Unit-VI	**File Handling**	**04 Hours**
Standard C Vs. Unix File I/O, Streams and Files, File System Basics- The File Pointer, Opening a File, Closing a File, Writing a Character, Reading a Character, Using fopen( ), getc( ), putc( ), and fclose( ), Using feof( ), Working with Strings: fputs( ) and fgets( ), fread( ) and fwrite( ), fseek( ) and Random-Access, fprintf( ) and fscanf( ), The Standard Streams		

Experiment List:

Experiment No	Problem Statement	Blooms Taxonomy
Experiment No 1	Develop a program to compute the roots of a quadratic equation by accepting the coefficients. Print appropriate messages.	**Apply**
Experiment No 2	Develop a program to find the reverse of a positive integer and check for palindrome or not. Display appropriate messages.	**Apply**
Experiment No 3	An electricity board charges the following rates for the use of electricity: for the first 200 units 80 paise per unit: for the next100 units 90 paise per unit: beyond 300 units 1 per unit. All users are charged a minimum of 100 as meter charge. If the total amount is more than 400, then an additional surcharge of 15% of total amount is charged. Write a program to read the name of the user, number of units consumed and print out the charges.	**Apply**
Experiment No 4	Develop a program to compute sin(x) using Taylor series approximation. Compare your result with the built-in Library function. Print both the results with appropriate messages.	**Apply**
Experiment No 5	Develop a program to find the square root of a given number N and execute for all possible inputs with appropriate messages. Note: Don't use library function sqrt(n).	**Apply**
Experiment No 6	Write a program to display truth value of a given statement	**Apply**
Experiment No 7	Write a program to perform union, intersection, symmetric difference of given two sets.	**Apply**
Experiment No 8	Write a program to find the properties (reflexive, symmetric, transitive, irreflexive) of given relation using matrix.	**Apply**
Experiment No 9	Write a program to read a relation, check whether it is a function if yes, find the type of function (onto, into, one to one, one to one onto).	**Apply**

Experiment No 10	Write a program to find compositions of Relation OR Function	**Apply**
Experiment No 11	Write a program to find the path from one node to another node based on given adjacency matrix.	**Apply**
Experiment No 12	Find the Hamming code distance (7,4) by considering the data to be transmitted and by considering the Even or Odd Parity, check at whether error is there if error then what will be the right code word.	**Apply**
Experiment No 13	A bit stream 1101011011 is transmitted using the standard CRC method. The generator polynomial is x 4 +x+1. What is the actual bit string transmitted.	**Apply**
Experiment No 14	Write a program to find the class of entered IP, Input the IP Address in (Binary/Decimal) form.	**Apply**
Experiment No 15	Write a program to find the subnet mask of entered IP, Input the IP Address (Binary/Decimal) form.	**Apply**
Experiment No 16	Write a program to find the given string is Valid IP Address or Not.	**Apply**
Experiment No 17	Write functions to implement string operations such as compare, concatenate, string length. Convince the parameter passing techniques.	**Apply**
Experiment No 18	Write a program to swap two numbers without using third variable.	**Apply**
Experiment No 19	Write a program to read the information of student and display the result of student using structure.	**Apply**
Experiment No 20	Write a program to copy content of one file to another file	**Apply**

Course delivery methods	Assessment methods
1. Black Board Teaching 2. Power Point Presentation 3. Online IDE	1. Internal Assessment 2. Assignment 3. Quiz

ISA (Term Work) Evaluation:

The ISA (term work) will be assessed and evaluated based on performance of students in various activities conducted in practical sessions.
The distribution for ISA (term work) marks shall be as follows (50 marks):

Timely performance	Attendance	Timely Journal Checking	Problem Solving Attitude and VLAB Activity	Oral Performance
10 Marks	**10 Marks**	**10 Marks**	**10 Marks**	**10 Marks**

Minimum marks required to qualify for ISA: 20 out of 50 marks

End Semester Examination ESE: (Practical & Oral Examination):

1.	It will be conducted for 50 marks having 2 hours duration.		
2.	Three Problem Statements will be given.		
3.	Initial write up: Algorithm/Flowchart/Tracing	**10 Marks**	**50 Marks**
	Oral	**10 Marks**	
	Conduct of experiment(s), result and conclusion	**30 Marks**	
4.	Oral is conducted for individual student and not in group		
5.	**Minimum passing marks to be scored in POE: 20 out of 50 marks**		

Text Book:

1. *"Herbert Schildt, C: The Complete Reference"*, McGraw Hill, 4th Edition
2. R G Dromey : *"How To Solve It By Computer"*

Reference Books:

1. *"Programming in C"*, Stephen G. Kochan, Fourth Edition, Pearson Education.
2. Brian W. Kernighan and Dennis M. Ritchie, *"The C Programming Language"*, Prentice
3. *"Problem Solving and Program Design in C"*, by Jeri R. Hanly, Elliot B. Koffman, Pearson Addison-Wesley
4. *"Let Us C"* by Yashwant P. Kanetkar.
5. *"Pointers in C"* by Yashwant P. Kanetkar.

Web Links/ Video Lectures / Practical /Experiments

1. http://cse02-iiith.vlabs.ac.in/
2. https://nptel.ac.in/courses/106/105/106105171/
3. https://codeforwin.org/category/c-programming

CO-PO Mapping:

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	--	1	1	--	3	--	--	2	3
CO2	3	1	3	--	2	1	--	3	--	--	--	3
CO3	3	--	3	1	2	1	--	--	--	--	--	3
C04	3	1	3	--	2	1	--	3	--	--	--	3
CO5	3	2	3	1	3	1	--	3	--	3	1	3

Syllabus Setting Committee:

Sr. No.	Name of the faculty	Email-Id	Mobile
1	Prof. R. B. Patil	rbpatil@tkietwarana.ac.in	9975419483
2	Prof. Sachin A. Urabinahatti	saurabinahatti@tkietwarana.ac.in	8379951800

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Second Year B. Tech (CSE) (Semester – III)

CSE303P : Data Structures Lab

Teaching Scheme	Credits :	Examination Scheme
Practical: 02 Hrs/Week	01	**ESE:** 50 Marks **ISA:** 50 Marks

Course Description:

The course is designed to develop skills to design and analyze simple linear and non linear data structures. It strengthen the ability to the students to identify and apply the suitable data structure for the given real world problem. It enables them to gain knowledge in practical applications of data structures

Prerequisites:	1. Basic Knowledge of C 2. Basic mathematical Approach

Course Objectives:

1. To make the students familiar with basic data structures.
2. To provide students with foundation in computer programming/ problem solving.
3. To enable the students to select appropriate data structures in computer applications.
4. To provide the detail of implementation of various data structures

Course Outcomes:

COs	At the end of successful completion of the course the student will beable to	Blooms Taxonomy
CO1	Identify the appropriate data structure for specific application	Remember
CO2	Identify the appropriate sorting and searching algorithms for a given problem size/datasets	Understand
CO3	Outline the solution to the given software problem with appropriate data structure.	Analyze

Course Contents

Experiment-I	Searching	Analyze

Students Should Write the C Programs for:

1. Linear Search algorithm
2. Binary Search algorithm

Also Compare the Complexities of the Algorithms.

Experiment -II	Sorting	Analyze

1. Program for Bubble Sort and find number of iterations.
2. Program for Insertion Sort and find number of iterations.
3. Program for Selection Sort and find number of iterations.

Also Compare the Complexities of the Algorithms.

Experiment -III	Stack	Understand

Program for Implementation of Stack operations

1. Push 2. Pop 3.Display

Experiment -IV	Queue	Understand

Program for Implementation of Linear Queue and Circular Queue with operations

1. enqueue 2.dequeue 3.display

Experiment -V	Singly Linked List	Analyze
Program for Implementation of Singly Liked List with the listed operations a. insert at start b. insert at end c. insert at given location d. delete at start e. delete at end f. delete at given location g. search for given data item h. display the contents of list Find the various data structures that can be implemented through the above functionalities.		
Experiment -VI	**Doubly Liked List**	**Analyze**
Program for Implementation of Doubly Liked List with the listed operations a. insert at start b. insert at end c. insert at given location d. delete at start e. delete at end f. delete at given location g. search for given data item h. display the contents of list from start to end i. display the contents of list from end to start Find the various data structures that can be implemented through the above functionalities.		
Experiment-VII	**Merging two linked lists**	**Understand**
Write a Program for merging two linked lists		
Experiment-VIII	**Binary Tree Traversal**	**Understand**
Program for Implementation of Binary Tree to perform recursive traversal methods a. preorder b. postorder c. inorder		
Experiment -IX	**Binary Search Tree**	**Understand**
Program to creation of binary search tree and its inorder traversal..		
Experiment -X	**Graph**	**Understand**
Program to implement Adjacency Matrix Representation of Graph. Also implement the DFS and BFS traversal mechanism.		

Course delivery methods	Assessment methods
1. Black Board Teaching 2. Power Point Presentation	1. Internal Assessment 2. Experiments 3. Quiz

ISA (Term Work) Evaluation:

The ISA (term work) will be assessed and evaluated based on performance of students in various activities conducted in tutorial and practical sessions. The distribution for ISA (term work) marks shall be as follows(For 50 marks):			
Timely performance and submission of Journal	Attendance	Quizzes/Activities/Presentations /VLABS/Problem Solving etc.	Oral Performance
10 Marks	**10 Marks**	**15 Marks**	**15 Marks**

Minimum marks required to qualify for TW: 20 out of 50 marks

End Semester Examination ESE: (Practical & Oral Examination):

1.	It will be conducted for 50 marks having 3 hours duration.		
2.	Only one experiment to be conducted.		
3.	Initial write up: Algorithm/Flowchart/Tracing	**10 Marks**	**50 Marks**
	Oral/ Providing Theoretical Solution	**10 Marks**	
	Conduct of experiment(s), result and conclusion	**20 Marks**	
	One marks question	**10 Marks**	
4.	Oral is conducted for individual student or a group of 2 to 3 students.		
5.	**Minimum passing marks to be scored in POE: 20 out of 50 marks**		

Text Book:

1. *"Schaum's Outlines Data Structures"* - Seymour Lipschutz (MGH)

Reference Books:

1. *"Data Structure using C"*- A. M. Tanenbaum, Y. Langsam, M. J. Augenstein (PHI)
2. *"Data Structures- A Pseudo code Approach with C"* - Richard F. Gilberg and Behrouz A. Forouzon 2nd Edition
3. *"Data Structures through C"* -Yashvant P Kanetkar BPB Publication

CO-PO Mapping:

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	--	--	--	--	--	1	--	2
CO2	3	3	1	1	--	--	--	--	--	1	--	2
CO3	3	2	3	2	--	--	--	1	--	1	2	2

1-Low, 2-Medium, 3-High

Syllabus Setting Committee:

Sr. No.	Name of the faculty	Email-Id	Mobile
1	Prof. K. K. Awale	kiran_awale@tkietwarana.ac.in	8793453354
2	Prof. Sachin A. Urabinahatti	saurabinahatti@tkietwarana.ac.in	98379951800
3	Prof. S. S. Matsagar	ssmatsagar@tkietwarana.ac.in	8421507130

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Second Year B. Tech(CSE) (Semester – III)

CSE305P : Digital System and Microprocessor

Teaching Scheme	Credits :	Examination Scheme
Practical: 02 hrs/Week	01	**TW:** 25 Marks **OE:** 25 Marks

Course Description:

This Course is designed to realize the standard building blocks of digital system and microprocessor for Second Year B. Tech students

Prerequisites:	1. Fundamentals of Computers. 2. Computer Programming using C , Subject code FYESC107

Course Objectives:

1. To study and perform arithmetic operations on number system.
2. Introduce the basics of Minimizing Boolean functions by using various techniques like K-Map method and implement by using suitable Logic gates and MSI chips.
3. To understand the functionality and design of Combinational and Circuits.
4. To understand the operation and design of different counters and registers.
5. To overview of microcomputer System and Programming Model of 8086 microprocessors.
6. To write and execute the assembly language programs using 8086 Instruction sets.

Course Outcomes:

COs	At the end of successful completion of the course the student will beable to	Blooms Taxonomy
CO1	**Realize** the combinational logic circuits by using various logical blocks	Understand
CO2	**Understand** the architecture of the 8086 processor and to use the tools for programming.	Understand
CO3	**Apply** different simplification tools for Boolean functions and design the logic circuits.	Apply
CO4	**Apply** the assembly language programs to develop and execute the different application.	Apply

Course Contents

Experiment -1	**Number Systems**	**Understand**
I. Convert the Binary numbers to Decimal, Octal and Hexadecimal. II. Convert the Decimal numbers to Binary, Octal and Hexadecimal III. Convert the Octal numbers to Decimal, Binary and Hexadecimal IV. Convert the Hexadecimal numbers to Decimal, Octal and Binary		
Experiment - 2	**Logic Gates**	**Understand**
Realization of Basic Logic Gates and Universal Gates		
Experiment - 3	**Combinational Logic Circuits**	**Apply**
Design and Implement the combinational logic Circuits using SOP and Simplify using Boolean theorems.		
Experiment - 4	**K-Map (Karnaugh Map)**	**Apply**
Design and Implement the combinational logic Circuits and Simplify using K-Map.		

Experiment - 5	**Flip-Flops**	**Apply**
Design & Implementation of Flip-Flops		
Experiment - 6	**Adders**	**Apply**
Design and Implementation of the Half and Full Adders.		
Experiment - 7	**Parity Generator**	**Apply**
Design & Implement the Parity Generator and Checker.		
Experiment - 8	**Debug Utilities & Assembler directives**	**Apply**
Practical Demonstration of Debug Utilities using Turbo Debugger and Assembler directives using Turbo Assembler		
Experiment - 9	**8086 Shift and Rotate Instructions Set**	**Apply**
Write X86 ALP to count number of positive and negative numbers from the list.		
Experiment - 10	**8086 Data Transfer Instructions Set**	**Apply**
Write X86 ALP to perform non-overlapped and overlapped block transfer (with and without string specific instructions). Block containing data can be defined in the data segment.		
Experiment - 11	**8086 Arithmetic Instructions Set -I**	**Apply**
Write X86/64 ALP to perform signed and Unsigned multiplication and Division of two 8-bit and 16 bit numbers and Check the overflow and Underflow conditions.		
Experiment - 12	**8086 Branch Instructions Set**	**Apply**
Write X86 program to sort the list of integers in ascending/descending order.		
Experiment - 13	**8086 Arithmetic Instructions Set -II**	**Understand**
Write X86/64 ALP to convert 4-digit Hex number into its equivalent BCD number and 5-digit BCD number into its equivalent HEX number. Make your program user friendly to accept the choice from user (using DOS INT) (a) HEX to BCD (b) BCD to HEX (c) EXIT. Display proper strings to prompt the user while accepting the input and displaying the result. (wherever necessary, use 64-bit registers)		
Experiment - 14	**8086 String Instructions Set**	**Understand**
Write X86/64 ALP to read String from the Keyboard and Display with appropriate message on the screen using DOS INT and perform the string data transfer using different string manipulation		
Experiment - 15	**8086 Arithmetic Instructions Set - III**	**Understand**
Write X86/64 ALP to read two numbers from the Keyboard and perform Arithmetic operations. Display the appropriate message and Output on the screen using DOS INT		

Course Delivery Method	Course Assessment Method
• Chalk and board • Pre recorded Video lectures/Animations • Use of VLAB/MOOC/NPTEL/FOSSEE etc • Demonstration of Standard Tools, Software related to the course • Logisim Free open source software • Trainer Kit/ National Instrumentation Multisim • Computer System with TASM , T-link , TASM Debugger S/W	• Internal assessment • Assignment/Case studies • Problem Solving • Periodic Journal Evaluation • Viva-voce

ISA (Term Work) Evaluation:

The ISA (term work) will be assessed and evaluated based on performance of students in various activities conducted in practical sessions. The distribution for ISA (term work) marks shall be as follows(For 25 marks):				
Timely performance of Experiments	Attendance	Timely Submission of Journal	Activities/ VLABS etc.	Oral Performance
5 Marks	**5 Marks**	**5 Marks**	**5 Marks**	**5 Marks**

Minimum marks required to qualify for ISA: 10 out of 25 marks

End Semester Examination (ESE) (Oral Examination):

1.	It will be conducted for 25 marks.		
2.	All experiment and related theory.		
3.	Journal Submission	**5 Marks**	**25 Marks**
	Applied problem solving	**5 Marks**	
	Students' ability to think on given problems	**5 Marks**	
	One marks question	**10 Marks**	
4.	Oral is conducted for individual student and not in group.		
5.	**Minimum passing marks to be scored in ESE: 10 out of 25 marks**		

Text Book:

1. *"Digital System, Principles and Applications"*: Ronal Tocci, Neal Widmer, Gregory Moss (Pearson Education) 10th Edition for 1st to 3rd Chapters
2. *"Microcomputer Systems, The 8086/8088 Family Architecture, Programming and Design"* by Yu-Cheng Liu Glenn A Gibson for 4th to 6th Chapters

Reference Books:

1. *"Digital Logic and Computer Design"* by M. Morris Mano
2. THE INTEL MICROPROCESSORS 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, Pentium Pro Processor, Pentium II, Pentium III, Pentium 4, and Core2 with 64-Bit Extensions Architecture, Programming, and Interfacing Eighth Edition BARRY B. BREY

CO-PO Mapping:

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	--	1	--	--	--	--	--	1	--	--	1
CO2	2	2	--	2	2	--	--	--	--	--	--	1
CO3	2	3	2	1	2	--	--	--	--	--	--	1
CO4	2	3	2	-	1	--	--	--	2	--	--	2

1-Low, 2-Medium, 3-High

Syllabus Setting Committee:

Sr. No.	Name of the faculty	Email-Id	Mobile
1	Prof. A. S. Phalle	asphalle@tkietwarana.ac.in	8888843820
2	Prof. Mrs. B. A. Chougule	bsmagadum@tkietwarana.ac.in	8698248242

TATYASAHEB KORE INSTITUTE OF ENGINEERING & TECHNOLOGY Autonomous Warananagar

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Second Year B. Tech(CSE) (Semester – III)
CSE307A: Audit Course III : Environmental Studies

Teaching Scheme	Credits :	Examination Scheme
Lectures: 02 Hrs / Week	Non Credit	**ESE:** 60 Marks **ISE:** 40 Marks

Course Description:

Prerequisites:	Understanding of Environment Education course.

Course Objectives:

- The syllabus of Environmental Studies provides an integrated, quantitative and interdisciplinary approach to the study of environmental systems.
- The students of Engineering undergoing this course would develop a better understanding of human relationships, perceptions and policies towards the environment and focus on design and technology for improving environmental quality.
- Their exposure to subjects like understanding of earth processes, evaluating alternative energy systems, pollution control and mitigation, natural resource management and the effects of global climate change, shall help the students to bring a systems approach to the analysis of environmental problems

Course Outcomes:

COs	At the end of successful completion of the course the student will beable to	Blooms Taxonomy
CO1	Relate the interdependency of environmental components	Analyze
CO2	Identify the environmental problems and prevent environmental pollution	Understand
CO3	Interpret impacts of waste on environmental components.	Understand
CO4	Analyze environmental change and its social impacts	Apply

Course Contents

Unit-I	Ecology:	04 Hours

Ecosystem, Ecological Pyramids, Food Chain, Food Web, Ecological Succession, Natural Resources and Associated Problems. Forest Resources, Water Resources, Mineral Resources, Food Resources, Energy Resources, Land Resources, Role of Individuals in Conservation of Natural Resources.

Unit-II	Pollution:	10 Hours

Water Pollution: Causes, Effects, Control, Drinking Water Quality Standards, Arsenic, Lead, Cadmium, Chromium, Fluoride Contamination & Its Effects, Water Treatment, Wastewater Treatment
Air Pollution: Causes, Effects, Control, Air Pollution Controlling Equipments, Air Quality Standards, National Air Quality Index, Vehicular Emission, Alternative Fuels, Indoor Air Pollution, Thermal Inversions, Photochemical Smog and Acid Precipitation
Noise Pollution: Causes, Effects, Control, Noise Standards Recommended By CPCB,
Environmental Protection Act: Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act, International and National Efforts for Environmental Protection.

Unit-III	Waste management:	04 Hours
Solid Waste Management, Biomedical Waste Management, E-Waste, Plastic Waste Management, Hazardous Waste Management, Carbon Footprint, Recycling of Waste, Role of Central Pollution Control Board (CPCB),State Pollution Control Board, and Role Of NGO'S		
Unit-IV	**Social Issues and Environment:**	**06 Hours**
Global Warming: Ozone Layer Depletion, Urban Problems Related To Energy, Alternative Energy Sources. **Evolution of Sustainable Development:** Timeline, Evolution of Green Movements in India, **Disaster Management:** Flood, Earthquakes, Cyclones, Landslides, Draught, Tsunami etc., Swachh Bharat Mission, Role of Information Technology in Environment and Human Health		

ISA (Project Work):

- Visit to Local Polluted site –Urban/Rural/Industrial/Agricultural

  OR
- Study of simple Ecosystems –Ponds, River, Hill slopes

  OR
- Preparation of small models or device to resolve the environment problem/issue
- Project work shall be based on programme

Evaluation Guidelines:

- This course is ***non-credit Audit Course*** and at the end of semester
- Course exam will be conducted as per the guidelines received from Institute.
- ***Exam (ESE) will be of 60 marks for Theory Paper and 40 marks for project report and same is to be converted in audit points by the programme.***
- Each Group of Project should consist of maximum 4-5 students.
- Project work shall be based on programme
- The project will be evaluated by respective branch HoD, Project Guide and Senior Faculty in respective Branch.
- There should be a presentation of Project before the committee and a hard copy is to be submitted.

Text Book:

1. Agarwal K. C., 2001 *"Environmental Biology"* by Nidi publication Ltd. , Bikaner
2. D. K. Asthana, Meera Asthana, *"A Textbook of Environmental Studies"* by S. Chand Publication Revised Edition, 2006.
3. S. Deswal & A. Deswal, *"Basic course in environmental Studies"* by Dhanpat Rai & Co Ltd. Publications, Delhi, Second revised edition, 2009

Reference Books:

1. Eldon D Enger, Bradley F. Smith, *"Environmental science - A Sudy of Inter- Relationships"* by Wm C Brown Publishers 1989
2. Francois Ramade, *"Ecology of Natural resources"* by John Wiley & Sons Publications, 2009
3. Robert Leo Smith, *"Ecology and field biology"* by Harper Collins Publishers, 1998
4. Gilbert M. Masters, *"Introduction to Environmental Engineering & Science"*, Prentice Hall International Inc. Second Edition

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