SEM-I

Government College of Engineering, Karad				
First Year (Sem – I) B. Tech. Information Technology				
IT3101: Applied Chemistry				
Teaching Scheme			**Examination Scheme**	
Lectures	03 Hrs/Week		**MSE**	20
Tutorials	00 Hrs/Week		**ISE**	20
Total Credits	03		**ESE**	60
			Duration of ESE	02:30 Hrs

Prerequisite : Basics of Chemistry

Course Outcomes (CO): Students will be able to

CO1	Interpret the construction, working and applications of battery.
CO2	Equipped with basic knowledge of polymer reinforced composites, applications of semiconductor conducting polymers in energy harnessing.
CO3	Acquire Basic knowledge of Nano chemistry to appreciate its applications in the field of Medicine, data storage devices and electronics.
CO4	Apply the principles of green chemistry in designing alternative reaction methodologies to minimize hazards and environmental degradation.

	Course Contents	CO	Hours
Unit 1	**Battery Science:** Battery Technology Introduction - Galvanic cell, electrode potential, EMF of the cell and cell representation. Batteries and their importance, Classification of batteries- primary, secondary and reserve batteries with examples. Electrical Vehicle Battery Construction, working advantages and disadvantages of EV Car. Construction, working and applications of Ni-Cd, Lithium based batteries – Li-ion & Li-poly, Metal Air Battery, Zinc Chloride battery– chemical reaction during charging and discharging of lead acid cell – applications – charging of Batteries – precautions during charging and discharging – trickle charging – indications of full charged battery – capacity of a battery – factors affecting the capacity of the battery – Ampere-Hour efficiency – Watt- Hour efficiency– flat plate battery – tubular battery – applications.	**CO1 CO2**	**(07)**
Unit 2	**Electrochemistry:** Introduction, Galvanic cell, Electrode potential, Single electrode potential, Standard electrode potential, Factor affecting electrode potential Nature of electrode, Concentration of ionic solution, Temperature, Electrochemical series, Application of electrochemical series, Electromotive force (EMF), Nernst equation, Fuel cells – Hydrogen – Oxygen fuel cell; Advantages and Applications. Electrochemistry Nernst Equation and application.	**CO1 CO2**	**(07)**
Unit 3	**Engineering Advanced Materials:** **Conducting Polymers:** Synthesis & Mechanism of conduction in poly acetylene. Biodegradable polymers: Introduction and their requirements. Synthesis and properties of Poly lactic acid. Applications of biodegradable polymers in medical industry. **Semiconducting material: -** n- type & p-type semiconductors, Preparations, properties and applications of semiconductors, Magnetic Properties. Properties of Poly lactic acid. Applications of biodegradable polymers in medical industry.	**CO3**	**(07)**
Unit 4	**Environmental & Green Chemistry:** Introduction, definition, Major environmental pollutants, Air, water and noise pollution. Optimum levels of pollution. Significance and determination of COD and BOD. Solid waste treatment of collection of NKP. Greenhouse effect and global Warming. eWaste. Radioactive pollution. Basic principles of green	**CO4**	**(07)**

	chemistry. Various green chemical approaches – Microwave synthesis, Bio catalyzed reactions, Phase transfer catalysis.		
Unit 5	**Storage Device Science:** Fuel Cells- Differences between battery and a fuel cell, Classification of fuel cells - based on type of fuel, Construction, working and applications of solid oxide fuel cell. Hydrogen cells, Photo conductive cells, Photo voltaic cells, characterization– super capacitor – applications rechargeable battery – applications – maintenance free battery – applications	**CO4**	**(07)**
Unit 6	**Nanomaterials:** Introduction, Nanomaterials- preparation of CNT by different methods, CNT properties and applications, size dependent properties (Surface area, Electrical, Optical, Catalytic and Thermal properties). Synthesis of nano materials: Top down and bottom up approaches, Carbon nano tubes and graphenes – properties and applications. Characterization method for Nano materials, SEM (Scanning Electron Microscope), AFM (Atomic Force Microscopy), STM ('Scanning Tunnelling Microscopy), Chemical process required for PCB & IC.	**CO1** **CO4**	**(07)**

Text Books	
1.	F. W. Billmeyer, Text Book of Polymer Science, John Wiley & Sons, 15th Edition, 2020.
2.	B. K. Sharma- A text book of Industrial Chemistry. 15th Edition, 2020. G.A. Ozin & A.C. Arsenault, "Nanotechnology A Chemical Approach to Nanomaterials".RSC Publishing, 5th Edition, 2020.
Reference Books	
1.	Uppal M.M, Jain and Jain, "Engineering Chemistry", Khanna Publishers, 45th Edition, 2020.
2.	P.C. Jain and Monica Jain, "A test Book of Engineering Chemistry, Dhanpat Rai Publications", New Delhi, 20th Edition, 2020.
3.	S SDara, "A Text book of Engineering Chemistry", S Chand & Company Ltd., 15th Edition, 2020.
4.	B. S. Jai Prakash, R. Venugopal, Sivakumaraiah & PushpaIyengar, "Chemistry for Engineering Students", Subash Publications, Bangalore. 10th Edition, 2020.
5.	"Modern Electrochemistry 2A: Fundamentals of Electrodics" by J O'M Bockeris and M G-Aldeco
6.	Handbook of Carbon Nanotubes Jiji Abraham, Sabu Thomas, Nandkumar Kalarikkal
Useful Links	
1.	https://www.youtube.com/watch?v=3O6OfCaVadI&list=PLm_MSClsnwm9p_yaZ8zIW1LxkK7_n98gD
2.	https://www.youtube.com/watch?v=kID3n_-kees
3.	https://www.youtube.com/watch?v=EvoN6vmiCfI&list=PLKSeO-scpOo33zdDN0i2uw1Xh3zh_UfGO
4.	https://www.youtube.com/watch?v=YFd0kb9Nwt0

Mapping of COs and Pos

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	3	2	-	-	-	2	2	-	-	-	-	-	-
CO 2	3	2	-	-	-	2	2	-	-	-	-	-	-
CO 3	3	2	-	-	-	2	2	-	-	-	-	-	-
CO 4	3	2	-	-	-	2	2	-	-	-	-	-	-

Assessment Pattern: (with revised Bloom's Taxonomy)

Knowledge Level	MSE	ISE	ESE
Remember	5	8	20
Understand	5	4	10
Apply	5	4	10
Analyse	5	4	20
Evaluate	-	-	-
Create	-	-	-
Total	20	20	60

Government College of Engineering, Karad

First Year (Sem – I) B. Tech. Information Technology

IT3102: Matrix Algebra and Differential Calculus

Teaching Scheme			**Examination Scheme**	
Lectures	03 Hrs/week		MSE	20
Tutorials	01 Hrs/week		ISE	20
Total Credits	04		ESE	60
			Duration of ESE	02 Hrs 30 Min

Prerequisite : Mathematics

Course Outcomes (CO): Students will be able to

CO1	Utilize concept of linear algebra for implementing Engineering domain problems.
CO2	Expand the function of real variables. Evaluate Indeterminate Forms
CO3	Deal with functions of several variables and their applications.
CO4	Apply advanced integral tools and vector calculus and in Engineering applications.

	Course Contents	**CO**	**Hours**
Unit 1	**Solution of System of simultaneous linear equations:** Rank of a matrix, Rank using normal & Echelon form, System of linear equations; consistency of homogeneous & nonhomogeneous systems, Linear dependence and independence of vectors.	**CO1**	**(07)**
Unit 2	**Eigen Values and Eigen Vectors:** Eigen values and Eigen vectors and their properties, Cayley-Hamilton Theorem (without proof), powers of matrix, diagonalization of matrices.	**CO1**	**(07)**
Unit 3	**Expansion of Functions and Indeterminate Forms:** Taylor's Series, Maclaurin's series, expansion using standard expansions, Indeterminate forms, L-Hospital rule, Evalution of limits and applications.	**CO2**	**(07)**
Unit 4	**Partial Differentiation:** Partial derivatives, Homogeneous functions and Euler's theorem, Composite function, total derivative, Maxima/Minima of functions of two variables.	**CO3**	**(07)**
Unit 5	**Vector Differentiation:** Scalar and vector point functions, Gradient of scalar point function, Directional Derivatives, Curl and Divergence of vector point functions. Solenoidal and irrotational force fields.	**CO4**	**(07)**
Unit 6	**Differential and Integral Calculus:** Gamma function, Beta function and its properties, Differentiation under integral sign, Leibnitz rule.	**CO4**	**(07)**
Tutorials Following is tentative list of tutorials to be conducted in the tutorial class 1. Rank, consistency of system of equations. 2. Linear dependence, independence of vectors. 3. Eigen values and Eigen vectors. 4. Powers of matrix and Diagonalization of matrices. 5. Expansion of functions and Indeterminate Forms. 6. Direct differentiation and Euler's theorem. 7. Composite function and total derivative. 8. Maxima/Minima of functions of two variables. 9. Directional Derivatives, Curl and Divergence of vector point function. 10. Beta, Gamma functions and DUIS.			**(10)**

Text Books

1.	Advanced Engineering Mathematics by H.K.Das, S. Chand and sons,22nd edition, 2018.
2.	Textbook of Engineering Mathematics by Debashis Datta New Age International Publication,6th edition 2006.

3.	Engineering Mathematics A Tutorial Approach, Ravish R..Singh, Mukul Bhatt.Tata, McGraw Hill 2010.
Reference Books	
1.	G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
2.	Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons,2006.
3.	Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008
4.	Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
5.	D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005
6.	Higher Engineering Mathematics, B. S. Grewal, 43th edition, Khanna publication, New Delhi 2013.
7.	Textbook of Engineering Mathematics by N P Bali and Dr.Manish Goyal, Laxmi publication 12th edition 2020.
Useful Links	
1.	http://www.nptel.iitm.ac.in
2.	www.ocw.mit.edu

Mapping of COs and POs:

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 6	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	2	2	1	2	-	-	-	-	-	-	-	-	-	-
CO 2	2	2	1	1	-	-	-	-	-	-	-	-	-	-
CO 3	2	2	1	1	-	-	-	-	-	-	-	-	-	-
CO 4	2	2	1	1	-	-	-	-	-	-	-	-	-	-

1: Slight(Low) 2: Moderate(Medium) 3: Substantial(High)

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	MSE	ISE	ESE
Remember	5	4	10
Understand	-	4	10
Apply	5	4	15
Analyse	5	4	10
Evaluate	5	4	15
Create	-	-	-
TOTAL	20	20	60

Government College of Engineering, Karad					
First Year (Sem – I) B. Tech. Information Technology					
IT3103: Basic Electronics Engineering					
Teaching Scheme			**Examination Scheme**		
Lectures	03 Hrs/week		MSE	20	
Tutorials	00 Hrs/week		ISE	20	
Total Credits	03		ESE	60	
			Duration of ESE	02 Hrs 30 Min	

Prerequisite : Mathematics, Computer Fundamentals

Course Outcomes (CO): Students will be able to

CO1	Outline the different number systems.
CO2	Analyze the different logic gates Boolean Algebra functions.
CO3	Design and analyze modular combinational circuits with MUX/DEMUX, Decoder and Encoder.
CO4	Analyze different types of Sensors

	Course Contents	CO	Hours
Unit 1	**Introduction to Electronics:** Evolution of Electronics, Impact of Electronics in industry and in society, Introduction to active and passive components, The Atom, Materials Used in Electronics- Insulators, Conductors, Current in Semiconductors, N-Type and P-Type Semiconductors, The PN Junction.	CO1	(08)
Unit 2	**Diode and Transistors:** Diode- Diode Operation, Voltage-Current (V-I) Characteristics of a Diode, Diode Models, Half-Wave Rectifiers, Full-Wave Rectifiers, Power Supply Filters and Regulators. Transistors-Bipolar Junction Transistor (BJT) structure, Operations, Characteristics and Parameters.	CO1	(07)
Unit 3	**Number Systems:** Binary numbers, Number-Base Conversion, Octal and Hexadecimal number system, Complements of numbers, Signed binary number system, BCD. Binary codes.	CO2	(05)
Unit 4	**Boolean Algebra:** Introduction, Digital logic gate, Basic theorems and Properties of Boolean Algebra, Boolean functions, Four-Variable K-Map, Product of Sum simplification, Don't-Care Conditions, NAND and NOR implementation.	CO2	(07)
Unit 5	**Combinational and Sequential Logic:** Introduction, Combinational circuits, Binary adder and subtractor, Binary multiplier, Decoders, Encoders, Multiplexers, Sequential circuits, Memory element latch, Flip- flops: Design, Truth table, Excitation table of Master Slave SR, JK level triggered, D, T flip flops.	CO2, CO3	(06)
Unit 6	**Sensors:** Classification of a sensors, Active /Passive Sensors, Analog/Digital Sensors, Motion Sensors (LVDT), Temperature Sensors (Thermistor), Semiconductor Sensors(Gas Sensors), Optical Sensors (LDR), Mechanical Sensors (Load Cell, Pressure sensors).	CO4	(07)

Text Books

1. Thomas. L. Floyd, "Electronics Devices", 9th Edition, Pearson, 2021. (Unit 1,2)
2. M Morris Mano, "Digital Design", Prentice Hall, 3rd Edition, 2001.(Unit: 3, 4, 5)
3. D. Patrnabis ,"Sensors and Transducers" by, 2nd Edition, PHI,2011.(Unit 6)

Reference Books

1. Wakerly Pearon, "Digital Design: Principles and Practices", Pearson Education, 3rd edition, 2004.
2. Anand Kumar, "Fundamentals of digital circuits", PHI publication, 1st edition, 2001.
3. R.P. Jain, "Modern Digital Electronics", Tata McGraw-Hill, 3rd Edition, 2003.

Useful Links

1. http://nptel.ac.in/courses/117105080/Prof. D. Roychoudhury IIT Kharagpur.

DEPARTMENT OF INFO. TECH. Board of Studies Year GCE KARAD

CHAIRMAN
Board of Studies
Department of Information Technology
Govt. College of Engineering, Karad

2.	http://nptel.ac.in/courses/117106086/Prof. S. Srinivasan IIT Madras.
3.	https://onlinecourses.nptel.ac.in/noc21_ee32/preview Prof. Hardik Jeetendra Pandya IISc Bangalore.

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 6	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2
CO 1	1	-	3	-	2	-	-	-	-	-	-	-	2
CO 2	-	3	1	-	-	-	-	-	-	-	-	1	-
CO 3	-	-	3	-	-	-	-	-	-	-	-	2	-
CO 4	-	1	2	-	-	-	-	-	-	-	-	2	-

1: Slight(Low) 2: Moderate(Medium) 3: Substantial(High)

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	MSE	ISE	ESE
Remember	5	5	10
Understand	5	5	20
Apply	5	5	10
Analyse	5	5	20
Evaluate	-	-	-
Create	-	-	-
TOTAL	20	20	60



CHAIRMAN
Board of Studies
Department of Information Technology
Govt. College of Engineering, Karad

Government College of Engineering, Karad				
First Year (Sem – I) B. Tech. Information Technology				
IT3104: Programming for Problem Solving				
Teaching Scheme			**Examination Scheme**	
Lectures	03 Hrs/week		MSE	20
Tutorials	00 Hrs/week		ISE	20
Total Credits	03		ESE	60
			Duration of ESE	02 Hrs 30 Min

Prerequisite : Computer Fundamentals

Course Outcomes (CO): Students will be able to

CO1	Outline Computer fundamentals and algorithm.
CO2	Develop ability to analyze problems using Control Statements and Functions.
CO3	Learn advanced features like Array, String and Structure.
CO4	Apply concept of Pointer and File Handling.

		CO	Hours
Unit 1	**Introduction to Programming** Introduction to components of a computer system. Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/Pseudocode with examples	**CO1**	**(05)**
Unit 2	**Introduction to C language** Importance of C Language, Structure of C Program, Constants, variables and data types. Operators and expressions, managing input / output operations, Decision making, branching and loop statements, Storage classes, Functions, elements of User defined functions, return values and their types, methods of parameter passing, recursive functions.	**CO1, CO2**	**(07)**
Unit 3	**Arrays and String** Declaration and initialization of arrays, one dimensional and two-dimensional arrays, operations on array, multidimensional arrays, Declaring and initializing string variables, string handling functions, passing array and string to function.	**CO3**	**(07)**
Unit 4	**Structure** Defining and declaring structure, accessing structure members, structure initialization, array of structures, nesting of structure structures and functions, union and enumeration.	**CO3**	**(07)**
Unit 5	**Pointer** Defining and declaring pointers, accessing the address space of a variable, declaring and initialization pointer variables, accessing a variable through its pointer, pointer as a function argument, pointer expressions, pointers to arrays, strings and structure, Dynamic memory allocation.	**CO3, CO4**	**(07)**
Unit 6	**File Handling** File Operations, Character I/O, String I/O, Formatted I/O, Block I/O, Random File Operations.	**CO4**	**(07)**

Text Books

1.	E. Balguruswami, "Programming in ANSI C", 6th edition– Tata McGraw Hill, 2012. (Unit 1,2,3,4,5,6)
2.	Yashvant Kanetkar, "Let us C", BPB publications, 2004. (Unit 1,2,3,4,5,6)

Reference Books

1.	B.W. Kernigghan and D. M. Ritchie, "The C Programming Language", 2nd Edition By, Pearson Education,1988.
2.	McGraw-Hill Publications, ISRD Group, "Programming And Problem Solving Using C Language", 1st Edition, 2017.
3.	Schaum's, "Outline of Programming with C", Byron Gottfried, McGraw-Hill,2nd Edition, 1996.

Useful Links

DEPARTMENT OF INFO. TECH. Board of Studies Year GCE KARAD

CHAIRMAN
Board of Studies
Department of Information Technology
Govt. College of Engineering, Karad

1.	http://cse02-iiith.vlabs.ac.in/
2.	https://www.digimat.in/nptel/courses/video/106105171/L01.html Prof. Anupam Basu,
3.	https://archive.nptel.ac.in/courses/106/104/106104128/ Satyadev Nandkumar

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2
CO 1	1	2	-	1	-	1	1	-	-	-	-	1	-
CO 2	-	1	3	2	1	1	-	-	-	-	-	2	-
CO 3	-	1	2	3	-	1	1	-	-	-	-	2	-
CO 4	2	1	1	2		1	-	-	-	-	-	-	-

1: Slight(Low) 2: Moderate(Medium) 3: Substantial(High)

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	MSE	ISE	ESE
Remember	5	6	10
Understand	5	4	20
Apply	5	4	10
Analyse	5	6	20
Evaluate	-	-	-
Create	-	-	-
TOTAL	20	20	60

DEPARTMENT OF INFO. TECH. Board of Studies Year GCE KARAD

CHAIRMAN
Board of Studies
Department of Information Technology
Govt. College of Engineering, Karad

Government College of Engineering, Karad					
First Year (Sem – I) B. Tech. Information Technology					
IT3105: Design Thinking					
Teaching Scheme			**Examination Scheme**		
Lectures	01 Hrs/week		MSE	--	
Practical	02 Hrs/week		ISE	50	
Total Credits	02		ESE	--	
Prerequisite : Professional Skills					
Course Outcomes (CO): Students will be able to					
CO1	Compare and classify the various learning styles and apply them in their engineering education.				
CO2	Develop new ways of creative thinking and learn the innovation cycle of Design Thinking process for developing innovative products.				
CO3	Prepare empathy map and journey map for problem.				
CO4	Possess skills necessary to communicate design engineering ideas and design and apply innovative ideas using prototypes.				
	Course Contents		**CO**	**Hours**	
Unit 1	**Overview of Design Thinking Process:** Understanding the Learning Process, Kolb's Learning Styles, Assessing and Interpreting, Design Thinking Process: Business context of innovation for applying design thinking, two models of design thinking, phases of design thinking.		**CO1, CO2**	**(04)**	
Unit 2	**Introduction to design thinking and its approaches:** Definition of Design Thinking, Need for Design Thinking, Objective of Design Thinking, Origin of design thinking, understanding design thinking and its process model, Human-Centered Design (HCD) process - Empathize, Define, Ideate, Prototype and Test and Iterate or Empathize, Analyze, Solve and Test.		**CO1**	**(05)**	
Unit 3	**Empathize** How to emphasize, Role of empathy in design thinking, purpose of empathy maps, Things to be done prior to empathy mapping, creation of user personas, customer journey mapping.		**CO2, CO3**	**(04)**	
Unit 4	**Analyze or Define** Root cause analysis, conflict of interest, perspective analysis, big picture thinking through system operator, big picture thinking through function modelling Silent brainstorming, metaphors for ideation, CREATE and What-If tool for ideation, introduction to TRIZ, Inventive principles and their applications		**CO1, CO2**	**(05)**	
Unit 5	**Test (Prototyping and Validation)** What is Prototype? Why Prototype? Rapid Prototype Development process, Testing, Sample Example, Test Group Marketing Prototyping, Assumptions during the design thinking process, Validation in the market, best practices of presentation.		**CO2, CO4**	**(05)**	
Unit 6	**Design Innovation** Benefits of iteration in the design thinking process, taking the idea to the market, introduction to innovation management in a company.		**CO4**	**(05)**	
	Laboratory Content				
Experiment 1	Understanding of Design Thinking and its process model, Principles, and tools. (Activity: Design a mind map for processes of design thinking).		**CO1, CO2**		
Experiment 2	How to Empathize, Role of Empathy in design thinking, Empathy Maps Design. (Activity: Construct empathy maps to provide right solution to any challenges through interviews, GD, observations, and other sources).		**CO3**		

DEPARTMENT OF INFO. TECH. Board of Studies Year GCE KARAD

CHAIRMAN
Board of Studies
Department of Information Technology
Govt. College of Engineering, Karad

Experiment 3	Methods for Empathetic Design, Creation of User Personas. (Activity: Construct Persona profile which includes user information).	**CO2, CO3**
Experiment 4	Customer Journey Mapping (Activity: Develop customer journey map to provide a roadmap visual of customers experience).	**CO3**
Experiment 5	Problem clarification, Understanding of the problem. (Activity: Construct worksheet for customer journey map to select best route).	**CO1**
Experiment 6	Problem analysis and Reformulation of the problem. (Activity: Generate summarised report for customer journey map).	**CO2**
Experiment 7	Case Study - students can pick one idea from their brainstorm list and use the "Sketch Prototype Worksheet" to sketch out their solution for their classmate.	**CO2**
Experiment 8	Root Causes Analysis, Conflict of Interest, Description of customer need.	**CO4**
Experiment 9	Design Cash Flow Diagram and Value Chain Analysis Diagram for weekly expenditure of person.	**CO2**
Experiment 10	Study the iterations in design thinking process.	**CO2, CO4**

Textbooks	
1.	Bala Ramadurai, "Karmic Design Thinking", First Edition, 2020. (Unit:1,2,3,4,5,6)
2.	E. Balaguruswamy, "Developing Thinking Skills (The way to Success)", Khanna Book Publishing Company, 2022. (Unit:1,2,3,4,5,6)
Reference Books	
1.	Vijay Kumar,"101 "Design Methods: A Structured Approach for Driving Innovation in Your Organization".
2.	IDEO ,"Human-Centered Design Toolkit: An Open-Source Toolkit to Inspire New Solutions in the Developing World", IDEO 2011.
3.	Marc Stickdorn and Jakob Schneider," This is Service Design Thinking: Basics, Tools, Cases", BIS Publishers,2014.
4.	Ulrich, Karl T. Design: Creation of artifacts in society, 2011.
5.	Tim Brown "Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation", Harper Collins, 2009.
Useful Links	
1.	https://onlinecourses.nptel.ac.in/noc22_mg32/preview By Prof. Bala Ramadurai/ IIT Madras
2.	https://youtu.be/4nTh3AP6knM by Simplilearn
3.	https://www.tutorialspoint.com/design_thinking/design_thinking_introduction.htm

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2
CO 1	1	2	1	1	-	1	-	-	-	-	-	1	1
CO 2	1	1	2	2	-	-	-	1	-	-	-	2	1
CO 3	1	1	3	2	2	-	-	-	2	2	-	1	1
CO 4	1	2	2	1	1	1	-	-	-	-	-	2	1

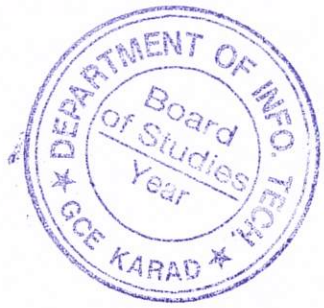
1: Slight(Low) 2: Moderate(Medium) 3: Substantial(High)

DEPARTMENT OF INFO. TECH. Board of Studies Year GCE KARAD

CHAIRMAN
Board of Studies
Department of Information Technology
Govt. College of Engineering, Karad

Assessment Pattern:

Skill Level (as per CAS Sheet)	Exp 1	Exp 2	Exp 3	Exp 4	Exp 5	Exp 6	Exp 7	Exp 8	Exp 9	Exp 10	Avg
Task I	25	25	25	25	25	25	25	25	25	25	25
Task II	15	15	15	15	15	15	15	15	15	15	15
Task III	15	15	15	15	15	15	15	15	15	15	15
ISE	50	50	50	50	50	50	50	50	50	50	50



CHAIRMAN
Board of Studies
Department of Information Technology
Govt. College of Engineering, Karad

Government College of Engineering, Karad				
First Year (Sem – I) B. Tech. Information Technology				
IT3106 : Applied Chemistry Lab				
Laboratory Scheme:			**Examination Scheme:**	
Practical	02 Hrs/week		ISE	50
Total Credits	01		ESE	--
Prerequisite : Basics of Chemistry				
Course Outcomes (CO): Students will be able to				
CO1	Analyze & generate experimental skills.			
CO2	Learn and apply basic techniques used in chemistry laboratory for preparation, purification and identification.			
CO3	Employ the basic techniques used in chemistry laboratory for analyses such as PH Metry, IR spectroscopy, volumetric titrations.			
CO4	Learn safety rules in the practice of laboratory investigations			

	Course Contents	CO
Experiment 1	Determine the total hardness of water.	**CO1,CO3,CO4**
Experiment 2	Determine calorific value of coal sample.	**CO1,CO3,CO4**
Experiment 3	Determine the chloride content from water	**CO1,CO3,CO4**
Experiment 4	Preparation of urea formaldehyde	**CO1,CO2,CO3,CO4**
Experiment 5	Preparation of phenol formaldehyde	**CO1,CO2,CO3,CO4**
Experiment 6	Determine the amount of dissolved oxygen in water	**CO1,CO2,CO3,CO4**
Experiment 7	Preparation of Paracetamol as antipyretic drug.	**CO1,CO2,CO3,CO4**
Experiment 8	Determination of % of Zinc in brass using standard EDTA Solution.	**CO1,CO3,CO4**
	Demonstration Experiment	
Experiment 09	Verification of Lambert's-Beer's law.	**CO1,CO2,CO3,CO4**
Experiment 10	Determination of pH of solution	**CO1,CO2,CO3,CO4**
Experiment 11	Determination of functional group in organic compound by IR spectroscopy.	**CO1,CO2,CO3,CO4**

List of Submission:	
1.	Minimum number of Experiments : 10

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 6	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2
CO 1	3	2	-	-	-	2	2	-	1	-	-	1	-
CO 2	3	2	-	-	-	2	2	-	1	-	-	1	-
CO 3	3	2	-	-	-	2	2	-	1	-	-	1	-
CO4	3	2	-	-	-	2	2	-	1	-	-	1	-

1: Slight(Low) 2: Moderate(Medium) 3: Substantial(High)

Assessment Pattern:

Skill Level (as per CAS Sheet)	Exp 1	Exp 2	Exp 3	Exp 4	Exp 5	Exp 6	Exp 7	Exp 8	Exp 9	Exp 10	Exp 11	Avg
Task I	15	15	15	15	15	15	15	15	15	15	15	15
Task II	05	05	05	05	05	05	05	05	05	05	05	05
Task III	05	05	05	05	05	05	05	05	05	05	05	05
ISE	25	25	25	25	25	25	25	25	25	25	25	25

Government College of Engineering, Karad				
First Year (Sem – I) B. Tech. Information Technology				
IT3107 : Programming for problem solving Lab				
Laboratory Scheme:			**Examination Scheme:**	
Practical	02 Hrs/week		ISE	50
Total Credits	01		ESE	25

Prerequisite : Computer fundamentals

Course Outcomes (CO): Students will be able to

CO1	Outline the basics of C programming language, including syntax, data types.
CO2	Demonstrate the ability to write and execute C programs using control statements.
CO3	Solve the real world problems using function, array, strings, and structure.
CO4	Develop debugging and testing skills to identify and resolve errors in C programs file handling and graphics.

Course Contents		CO
Implementation of following concepts		
Experiment 1	Introduction to various components of programming environment	**CO1**
Experiment 2	Decision making statements	**CO2**
Experiment 3	Loop statements	**CO2**
Experiment 4	Passing argument to functions	**CO3**
Experiment 5	1-D and 2-D array and operations on array	**CO3**
Experiment 6	String using string handling functions	**CO3**
Experiment 7	Array of structure	**CO3**
Experiment 8	Call by value and call by reference	**CO3**
Experiment 9	Dynamic memory allocation using various functions	**CO4**
Experiment 10	File handling operations	**CO4**
Experiment 11	C graphics to draw different objects	**CO4**
Experiment 12	C graphics to demonstrate animation	**CO4**
List of Submission:		
	Minimum number of Experiments : 10	

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2
CO 1	3	-	-	1	-	1	1	-	-	-	-	-	2
CO 2	1	2	-	1	-	1	1	-	-	-	-	1	-
CO 3	-	1	3	2	1	1	-	-	-	-	-	2	-
CO 4	-	1	2	3	-	1	1	-	-	-	-	2	-

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Assessment Pattern:

Skill Level (as per CAS Sheet)	Exp 1	Exp 2	Exp 3	Exp 4	Exp 5	Exp 6	Exp 7	Exp 8	Exp 9	Exp 10	Avg
Task I	25	25	25	25	25	25	25	25	25	25	25
Task II	15	15	15	15	15	15	15	15	15	15	15
Task III	15	15	15	15	15	15	15	15	15	15	15
ISE	50	50	50	50	50	50	50	50	50	50	50

DEPARTMENT OF INFO. TECH. Board of Studies Year GCE KARAD

CHAIRMAN
Board of Studies
Department of Information Technology
Govt. College of Engineering, Karad

Government College of Engineering, Karad				
First Year (Sem – I) B. Tech. Information Technology				
IT3108: Professional Communication Skills				
Laboratory Scheme			**Examination Scheme**	
Lecture	01Hrs/week		ISE	50
Practical	02Hrs/week		ESE	25
Total Credits	02			

Course Outcomes (CO): Students will be able to

CO1	Provide a learning environment to practice listening, speaking, reading and writing skills.
CO2	Assist the students to carry on the tasks and activities through guided instructions and materials
CO3	Effectively integrate English language learning with employability skills and training.
CO4	Provide hands-on experience through case-studies, mini-projects, group and individual presentations.

	List of Experiments	CO
Experiment 1	**Newspaper Reading**, finding difficult English words to enhance the glossary. Write down the summary of News and Present it effectively.	**CO1**
Experiment 2	**Reading Skills-** Reading Book (Any book) finding difficult English words to enhance the glossary. Write down the summary of book/any Topic and Present it effectively. Self-Introduction Activity	**CO1**
Experiment 3	**Reading Sills-** Watching English Movies Write down the same to Summaries. Strategies for Creating & Editing Effective Writing -Email Writing Activity	**CO2**
Experiment 4	**Reading Skills-** Listening English podcast, (seen and the unseen) Write down the same to Summaries. Extempore Activity	**CO3**
Experiment 5	**Reading Skills-** Reading Readers Digest/India Today/Autocar/EFY. Write down the same to Summaries. Strategies for Creating & Editing Effective Writing=Blog Writing (specific/suggest topics/give topics)	**CO1**
Experiment 6	**Watching Ted Talk and summarize it.** Strategies for Creating & Editing Effective Writing -Story writing and Narration	**CO3**
Experiment 7	**Develop a Welcome speech** on the given Theme/situation /Formulate a speech for introducing a guest in the given situation. **Group Discussion-** Group Discussion Rules	**CO3**
Experiment 8	**Just a Minute (JAM) -**Prepare for 1 min on spontaneous topic and deliver public talk on same.Solving MNC (Company 1) Verbal Ability questions	**CO4**
Experiment 9	**Debate:** International Topic and summarize the opinion as a Country. Strategies for Creating & Editing Effective Writing -Email Writing Activity2	**CO4**
Experiment 10	**Writing effective resumes and Cover Letters** Mock Interviews (Personal HR)	**CO3**

Text Books

1.	AICTE's Prescribed Textbook: English (with Lab Manual), Khanna Book Publishing Co.
2.	Kul Bhushan Kumar, Effective Communication Skills. Khanna Book Publishing, 2022.
3.	Practical English Usage. Michael Swan. OUP. 1995. 4. Remedial English Grammar. F.T. Wood. Macmillan.2007 5. On Writing Well. William Zinsser. Harper Resource Book. 2001 6. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006. https://www.coursera.org/specializations/improve-english

List of Submission

1	Total number of Experiments: Minimum 10
2	Total number of sheets: NA

3	Project/Dissertation Report: NA
4	Seminar report: NA
5	Field Visit Report: NA

Mapping of COs and Pos

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 6	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	2	2	1	2	-	-	-	-	-	-	-	-	-	-
CO 2	2	2	1	1	-	-	-	-	-	-	-	-	-	-
CO 3	2	2	1	1	-	-	-	-	-	-	-	-	-	-
CO 4	2	2	1	1	-	-	-	-	-	-	-	-	-	-

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Assessment Pattern(with revised Bloom's Taxonomy)

Knowledge Level	ISE	ESE
Remember	-	-
Understand	10	05
Apply	15	05
Analyse	15	10
Evaluate	10	05
Create	-	-
TOTAL	50	25

Government College of Engineering, Karad				
First Year (Sem–I) B. Tech. Information Technology				
IT3110: Yoga				
Laboratory Scheme:			**Examination Scheme:**	
Practical	02 Hrs/Week		ISE	50
Total Credits	01		ESE	-

Prerequisite: Basics of Yoga

Course Outcomes (CO): Students will be able to

CO1	Outline basic skills associated with yoga which builds up physical, mental strength, flexibility, balance and coordination.
CO2	Learn breathing exercises and healthy fitness activities.
CO3	Learn techniques for increasing concentration and decreasing anxiety which leads to stronger academic performance.
CO4	Develop understanding of psychological problems associated with the age and lifestyle. Also apply injury prevention principles related to yoga.

Course Contents	CO
Following list of topics and practical's are only the guidelines to the instructor: • योगाचा इतिहास: योगसूत्र ग्रंथ, पतंजली मुनी. • अष्टांग योग: १. यम: अहिंसा,सत्य,अस्तेय,ब्रम्हचर्य,अपरिग्रह २. नियम:शौच,संतोष,तपास,स्वाध्याय,ईश्वरप्रणीधान ३. आसन: विविध स्थितीतील आसने ४. प्राणायाम : विविध प्रकार ५. प्रार्थना ६. धारणा: एकाग्र चित्त ७. ध्यान ८. समाधी वरील अष्टांग योगाचे थोडक्यात महत्व • सूर्यनमस्कार: महत्व व फायदे प्रात्यक्षिक : प्रार्थना,सूर्यनमस्कार,आसने,प्राणायाम व ध्यान याचा सराव	CO1 CO2 CO3 CO4

Reference Books	
1.	Nagendra, H. R. & Nagarathna, R. "Samagra Yoga Chikitse", Bengaluru Swami Vivekananda Yoga Prakasana,2002.
2.	Kumar, Ajith, "Yoga Pravesha" Bengaluru: Rashtrothanna Prakashana,1984.
3.	D.M Jyoti, "Yoga and Physical Activities", lulu.com3101, Hills borough, NC27609, United States, 2015.
4.	Uppal, A.K., "Physical Fitness. New Delhi : Friends Publication, 1992.

DEPARTMENT OF INFO. TECH. Board of Studies Year GCE KARAD

CHAIRMAN
Board of Studies
Department of Information Technology
Govt. College of Engineering, Karad

Mapping of COs and POs

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

1: Slight(Low) 2: Moderate(Medium) 3: Substantial(High)

Assessment Pattern:

The evaluation will be done on the basis of participation and performance of students in practical hours. The consistency and accuracy in yoga, intrinsic goodness, right attitude, happiness and joyous way of doing things will be observed by yoga teacher.

DEPARTMENT OF INFO. TECH. Board of Studies Year GCE KARAD

CHAIRMAN
Board of Studies
Department of Information Technology
Govt. College of Engineering, Karad

Government College of Engineering, Karad				
First Year (Sem–I) B. Tech. Information Technology				
MS3112: Makers Space Laboratory I				
Laboratory Scheme			**Examination Scheme**	
Practical	04 Hrs/week		ISE	75
Total Credits	02		ESE	25

Prerequisite: Basic concepts of Physics, Chemistry and Mathematics

Course Outcomes (CO): Students will be able to

CO1	Use basic engineering tools and laboratory equipment.
CO2	Integrate mechanical, electrical, electronic, civil, and computing concepts.
CO3	Prepare technical documentation and engineering reports.
CO4	Work collaboratively in multidisciplinary teams.

Course Contents

Module 1 (Civil Domain)

- Smart Sustainable Campus Planning
- Water and Air Quality Parametric analysis
- Road Intersection and Traffic Congestion Planning
- Waste Identification and Recycling/Reusing/Energy Generation Ideas

Module 2 (Mechanical Domain)

- Workshop and Fabrication Practices
- CAD and Product Design
- Mechanical-Electrical Integration
- Smart Structural Prototype

Module 3 (Electrical Domain)

- Electrical Safety, Tools and Basics Circuits
- Electrical Machines and Drives
- Renewable Energy Systems
- Electrical-Electronics Integration
- Smart Energy Prototype

Module 4 (E&TC Domain)

- Components in electronics and its characteristics, resistor, capacitor, inductor, transistor, diode, LED, etc.
- Basic electronics instruments handling
- Embedded systems
- PCB designing (Power supply designing)

Module 5 (IT Domain)

- Python Programing
- Raspberry Pi and Arduino IDE Installation, Setup and Programming
- Website Development
- Database Management System and Data Visualization Techniques

Module 6 (Project Management, Sustainability, and IPR)

- Introduction to Agile methodologies, teamwork, and project management tools.
- Importance of documentation in engineering projects.
- Fundamentals of sustainability, sustainability leadership, and carbon footprint analysis.
- Overview of Intellectual Property Rights (IPR), including patents, copyrights, and trademarks.

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
CO1	2	1	–	1	3	–	–	–	–	–	–
CO2	3	2	2	1	2	–	–	–	–	–	–
CO3	–	–	–	–	1	–	–	–	–	3	–
CO4	–	–	–	–	–	–	–	–	3	2	1

Guideline for Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	ISE	ESE
Remember	-	-
Understand	15	5
Apply	15	5
Analyse	15	5
Evaluate	15	5
Create	15	5
TOTAL	75	25