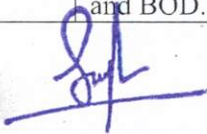
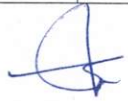


Government College of Engineering, Karad					
First Year (Sem – I) B. Tech. Information Technology					
IT3101: Applied Chemistry					
Teaching Scheme		Examination Scheme			
Lectures	03 Hrs/Week	MSE	20		
Tutorials	00 Hrs/Week	ISE	20		
Total Credits	03	ESE	60		
		Duration of ESE	02:30 Hrs		
Prerequisite : 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 Nanochemistry 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.				
CO5					
	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			CO4	(07)


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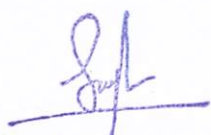

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	global Warming, eWaste, Radioactive pollution, Basic principles of green chemistry, Various green chemical approaches – Microwave synthesis, Bio catalyzed reactions, Phase transfer catalysis.		
Unit 5	Storage Device Science: Fuel Cells- Differences 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 & Pushpalyengar, "Chemistry for Engineering Students", Subash Publications, Bangalore. 10th Edition, 2020.		
5.	"Modern Electrochemistry 2A: Fundamentals of Electrodes" by J O'M Bockers 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	PO12	PSO1	PSO2
CO 1	3	2	-	-	-	2	2	-	-	-	-	1	-	-
CO 2	3	2	-	-	-	2	2	-	-	-	-	1	-	-
CO 3	3	2	-	-	-	2	2	-	-	-	-	1	-	-
CO 4	3	2	-	-	-	2	2	-	-	-	-	1	-	-
CO 5	3	2	-	-	-	2	2	-	-	-	-	1	-	-



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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

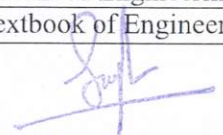


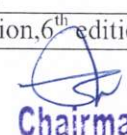
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Government College of Engineering, Karad					
First Year (Sem – I) B. Tech. Information Technology					
IT3102: Matrix Algebra and Differential Calculus					
Teaching Scheme			Examination Scheme		
Lectures	03 Hrs/week		MSE	20	
Tutorials	01 Hrs/week		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, Evaluation 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					(10)
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.					
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,6 th edition 2006.				


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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, 43 th edition, Khanna publication, New Delhi 2013.
7.	Textbook of Engineering Mathematics by N P Bali and Dr.Manish Goyal, Laxmi publication 12 th 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	PO 12	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	-	-	-	-	-	-	-	-	-	-	-

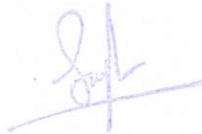
1: Slight(Low)

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


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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				
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, 3 rd 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, 3 rd edition, 2004.				
2.	Anand Kumar, “Fundamentals of digital circuits”, PHI publication, 1 st edition, 2001.				
3.	R.P. Jain, “Modern Digital Electronics”, Tata McGraw-Hill, 3 rd Edition, 2003.				
Useful Links					
1.	http://nptel.ac.in/courses/117105080/Prof. D. Roychoudhury IIT Kharagpur.				


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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	PO 12	PSO 1	PSO 2
CO 1	1	-	3	-	2	-	-	-	-	-	-	-	-	2
CO 2	-	3	1	-	-	-	-	-	-	-	-	-	1	-
CO 3	-	-	3	-	-	-	-	-	-	-	-	-	2	-
CO 4	-	1	2	-	-	-	-	-	-	-	-	-	2	-

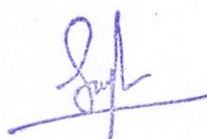
1: Slight(Low)

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

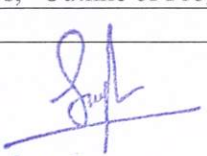


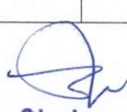
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Government College of Engineering, Karad					
First Year (Sem – I) B. Tech. Information Technology					
IT3104: Programming for Problem Solving					
Teaching Scheme			Examination Scheme		
Lectures	03 Hrs/week		MSE	20	
Tutorials	00 Hrs/week		ISE	20	
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”, 2 nd Edition By, Pearson Education,1988.				
2.	McGraw-Hill Publications, ISRD Group, “Programming And Problem Solving Using C Language”, 1 st Edition, 2017.				
3.	Schaum's, “Outline of Programming with C”, Byron Gottfried, McGraw-Hill,2 nd Edition, 1996.				
Useful Links					


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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	PO 12	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	-	-	-	-	-	-	-	-

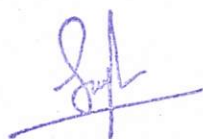
1: Slight(Low)

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

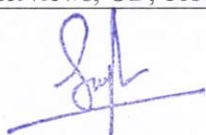


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Government College of Engineering, Karad					
First Year (Sem – I) B. Tech. Information Technology					
IT3105: Design Thinking					
Teaching Scheme			Examination Scheme		
Lectures	01 Hrs/week		MSE	--	
Practical	02 Hrs/week		ISE	50	
Total Credits	02		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	



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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	PO 12	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)

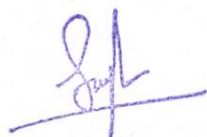
3: Substantial(High)


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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	15	15	15	15	15	15	15	15	15	15	15
Task II	05	05	05	05	05	05	05	05	05	05	05
Task III	05	05	05	05	05	05	05	05	05	05	05
ISE	25	25	25	25	25	25	25	25	25	25	25



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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	PO 12	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	-	-

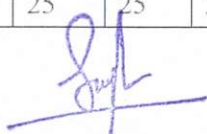
1: Slight(Low)

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


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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	PO 12	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	-

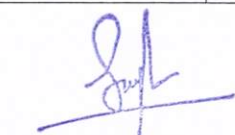
1: Slight (Low)

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	15	15	15	15	15	15	15	15	15	15	15
Task II	05	05	05	05	05	05	05	05	05	05	05
Task III	05	05	05	05	05	05	05	05	05	05	05
ISE	25	25	25	25	25	25	25	25	25	25	25



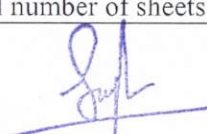
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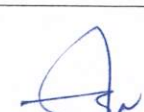
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Government College of Engineering, Karad				
First Year (Sem – I) B. Tech. Information Technology				
IT3108: Professional Communication Skills				
Laboratory Scheme			Examination Scheme	
Lecture	01Hrs/week		ISE	50
Practical	02Hrs/week		ESE	25
Total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


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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	PO 12	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

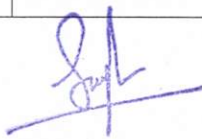


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Government College of Engineering, Karad				
First Year (Sem – I) B. Tech. Information Technology				
IT3109: Computer Workshop				
Laboratory Scheme:			Examination Scheme:	
Practical	04Hrs/week		ISE	50
Total Credits	02		ESE	50
Prerequisite : Computer Fundamentals				
Course Outcomes (CO):Students will be able to				
CO1	Identify different components of computer.			
CO2	Apply basic knowledge of computer fundamentals to solve common problems related to operating systems			
CO3	Design the network for computers			
CO4	Utilize various applications useful in day-to-day life.			
Course Contents				CO
Experiment 1	Familiarize a computer system layout: SMPS, Motherboard, FDD, HDD, CD / DVD drive and add on cards.			CO1
Experiment 2	Assemble a system with add on cards and check the working condition of the system			CO1
Experiment 3	Study of various types of the Memories.			CO1
Experiment 4	Study and Installation of Windows Operating System			CO2
Experiment 5	Study and Installation of Linux Operating System			CO2
Experiment 6	Study of Linux Commands and Utilities			CO2
Experiment 7	Build a dual boot machine by installing different operating systems on it and install software on various operating systems including GNU/Linux and Microsoft Windows using Virtual Machine.			CO2
Experiment 8	Introduction to Network Devices - Router, Hub, Switch and access points			CO3
Experiment 9	Prepare a working LAN cable by using crimping tools.			CO3
Experiment 10	Create basic networking setup using 2-4 PCs and networking hardware.			CO3
Experiment 11	Study of basic network command and Network configuration commands (IPconfig, Ping, Tracert and Netstat).			CO3
Experiment 12	Troubleshoot day to day life problems on personal computers, including issues related to: Network connection, display, power-on, software configuration, software network setup.			CO3
Experiment 13	Study of popular Web browsing tools.			CO4
Experiment 14	Configuration of Web Server (GlassFish, IIS)			CO4
Experiment 15	Case Study on Google Services – IT Support, IT Automation.			CO4
Experiment 16	Perform basic analytics using Microsoft Excel.			CO4
Experiment 17	Design and build tables, forms, reports, controls and queries in Microsoft Access.			CO4
Experiment 18	Develop a Mini Project based on concepts studied. Demonstrate and participate mini project in Science day exhibition.			CO4
List of Submission:				
1.	Minimum number of Experiments: 16			


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Mapping of COs and POs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO1	-	3	-	-	-	-	2	-	1	-	-	-	2	2
CO2	3	-	-	-	-	-	2	-	1	-	-	-	2	2
CO3	-	-	3	-	-	-	2	-	1	-	-	-	2	2
CO4	-	-	-	-	3	-	2	-	1	-	-	-	2	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	15	15	15	15	15	15	15	15	15	15	15
Task II	05	05	05	05	05	05	05	05	05	05	05
Task III	05	05	05	05	05	05	05	05	05	05	05
ISE	25	25	25	25	25	25	25	25	25	25	25



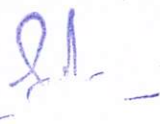
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Government College of Engineering, Karad				
First Year (Sem-I) B. Tech. Information Technology				
IT3110: Yoga				
Laboratory Scheme:			Examination Scheme:	
Practical	02 Hrs/Week		ISE	50
Total Credits	01		ESE	-
Prerequisite: Basics of Yoga				
Course 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:				CO1
- योगाचा इतिहास: योगसूत्र ग्रंथ, पतंजली मुनी. - अष्टांग योग: १. यम: अहिंसा, सत्य, अस्तेय, ब्रम्हचर्य, अपरिग्रह २. नियम: शौच, संतोष, तपास, स्वाध्याय, ईश्वर प्रणीधान 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				CO2
प्रात्यक्षिक : प्रार्थना, सूर्यनमस्कार, आसने, प्राणायाम व ध्यान याचा सराव				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.


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Mapping of COs and POs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	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	-	-

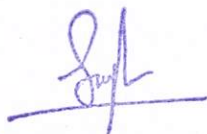
1: Slight(Low)

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.



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Government College of Engineering, Karad					
First Year (Sem – I) B. Tech. Information Technology					
IT3201: Applied Physics					
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 : Mathematics					
Course Outcomes (CO): Students will be able to					
CO1	State and Explain concepts of electrostatics, magneto statics, optics, magnetic and electric materials.				
CO2	Understand physical significance of terms in electrostatics, magneto static and fundamental properties of light, sound and advanced materials.				
CO3	Demonstrate applications of different physical phenomena in engineering and technology.				
CO4	Compute required physical quantity from given data.				
	Course Contents			CO	Hours
Unit 1	Electrostatics: Coulomb's law, Vector form of Coulomb's law, its Examples. Electric field, Electrostatic potential, Electrostatic potential due to charged sphere and electric dipole, Examples. Equipotential surface and their properties. Flux, Gauss's law and its applications. Gauss's law electrostatics in a dielectric medium.			CO1, CO2	(07)
Unit 2	Magnetostatics: Biot - Savart law, Ampere's law and its applications. Faradays law of induction, Lenz's law, Integral and Differential form of Faradays law. Equation of continuity, Displacement Current. Maxwell equations. Physical significance of Maxwell equations			CO1, CO2	(07)
Unit 3	Magnetic materials and Ultrasonic: Origin of magnetic moment, types of of Magnetic material: Dia, Para, ferro, anti-ferro and Ferrimagnetic materials, magnetic exchange interactions. Curie-Weiss law. Hysteresis, Soft and Hard Magnetic Materials, Ferrites, their Applications. Magnetic Devices. Ultrasonic waves: Ultrasonic waves, Characteristics of Ultrasonic waves, Magnetostriction oscillator and Piezoelectric, Oscillator, Applications. Problems			CO1, CO2 CO3	(07)
Unit 4	Semiconductors and Dielectrics Classification of solids on the basis of band theory, Introduction of Semiconductors and it's types, Fermi level in intrinsic and extrinsic semiconductors, Band diagrams for intrinsic and extrinsic semiconductors, electrical conductivity of conductors & semiconductors. Hall effect carrier life time and mobility and Examples. Applications Dielectrics: Introduction of dielectrics, dielectric constant, dielectric polarization, dielectric susceptibility, three field vector, polar, Non polar, Applications.			CO1, CO2 CO3	(07)
Unit 5	Superconductor and Nuclear Energy: Introduction, Property of superconductor, Meissner Effect, Type I and Type II superconductor, Concept of Cooper pair, BCS Theory, AC DC Josephson's Effect. Applications. Nuclear Energy: Introduction , Fission and Fusion reaction, Energy released in Fission Reaction, chain Reaction, Nuclear Reactor, P-P and C-N Reactions (Thermonuclear Reaction), Examples.			CO2, CO3, CO4	(07)
Unit 6	LASER and Fibre Optics: Introduction, Characteristics of LASER beam, Absorption, Spontaneous Emission, Stimulated Emission, Population Inversion, Types of pumping agent, Components of LASER, Lasing action, Solid-state lasers (ruby), Diode Laser, Applications of LASER in			CO2, CO3, CO4	(07)


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science and engineering, Holography Techniques.			
Text Books			
1.	Avadhanulu and Kshirsagar, “Engineering Physics”, S Chand publishing, 2010. (Unit: 3,4)		
2.	V. Rajendran , “Engineering Physics”, Tata McGraw-Hill Publishing Company limited, 2010 (Unit:5,6)		
3.	Donald A. Neamen “Semiconductor Physics and Devices: Basic Principles”, the McGraw-Hill Companies, Inc, Fourth Edition, 2021.(Unit: 1,2)		
Reference Books			
1.	S. O. Pillai, “Solid State Physics: Structure & Electron Related Properties”, Eastern Ltd, New Age International Ltd, 1994.		
2.	Charles Kittel,”Introduction to Solid State Physics”, Wiley India Pvt. Ltd, 8th Edition, 2005.		
3.	Alan Giambattista and others, “Fundamentals of physics”, Tata Mc. Graw Hills, 2007.		
4.	B. L. Theraja “Modern Physics” S. Chand & Company Ltd., Delhi, 2002.		
5.	R. K. Gaur & Gupta S. L, “Engineering Physics” Dhanapat Rai Publication, 2012.		
6.	Arthur Beiser , “Modern Physics” Tata Mc. Graw Hills, 1981.		
7.	K. Thyagarajan, A. K. Ghatak ,”LASERS Theory and Applications”, Macmillan India Limited,1981.		
8.	L. J. Schiff, “Quantum Mechanics” Mc-Graw Hill International Edition, 1955.		
9.	N. Subramanyam & Brijlal, “Text Book of Optics”, Vikas Publishing House Pvt.Ltd), 2012.		
Useful Links			
1.	en.wikipedia.org/wiki/ Fundamentals of Physics		
2.	www.hyperphysics.com		
3.	physics.info/magnetism , NPTEL video		

Mapping of COs and POs

PO \ CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	2	-	-	-	-	-	-	-	-	-	1	-	-
CO 2	3	2	-	-	-	-	-	-	-	-	-	1	-	-
CO 3	3	2	-	-	-	-	-	-	-	-	-	1	-	-
CO 4	3	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	4	20
Understand	5	4	-
Apply	5	4	10
Analyse	-	4	20
Evaluate	5	4	10
Create	-	-	-
Total	20	20	60

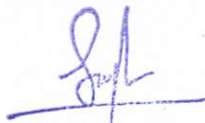


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Government College of Engineering, Karad					
First Year (Sem-II) B. Tech. Information Technology					
IT3202: Differential and Integral Calculus					
Teaching Scheme			Examination Scheme		
Lectures	03 Hrs/week		MSE	20	
Tutorials	01 Hrs/week		ISE	20	
Total Credits	04		ESE	60	
			Duration of ESE	02 Hrs 30 Min	
Prerequisite: Mathematics					
Course Outcomes (CO):Students will be able to					
CO1	Solve ODEs and LDE with constant coefficient arising in Engineering domain using analytic approach.				
CO2	Apply advance vector integral functions and techniques in evaluating complex problems.				
CO3	Express any periodic function in terms of series expansion.				
CO4	Calculate area enclosed by simple curves and volume of solid with the knowledge of higher order integrals.				
	Course Contents			CO	Hours
Unit 1	First Order Ordinary Differential Equations: Exact differential equations, Integrating Factor, Equations reducible to Exact, Linear and reducible to linear differential equations, Application to Simple Electrical circuits.			CO1	(07)
Unit 2	Linear Differential Equations with Constant Coefficients: Linear differential equations with constant coefficients, Methods to find C.F. and P.I. Method to find Particular Integral by shortcut method, method of variation of parameters, Cauchy-Euler equation, Legendre's Equations.			CO1	(07)
Unit 3	Fourier series: Dirichlet's conditions, Fourier series in the range $(0,2\pi)$ and $(-\pi,\pi)$,Change of interval, Fourier series in the range $(0, 2l)$ and $(-l, l)$ where l is arbitrary, Even and odd function, Half range sine and cosine series in the range $(0, l)$ where l is arbitrary.			CO3	(07)
Unit 4	Surface Integral and its Applications: Evaluation of double integration in cartesian and polar coordinates, Change of order of integration, change of variable, Area enclosed by plane curves.			CO3	(07)
Unit 5	Volume Integral and its Applications: Evaluation of Triple integration in Cartesian, spherical polar and cylindrical polar coordinates, Volume of solid by triple integral.			CO4	(07)
Unit 6	Vector Integration: Line integral, Surface integral, Green's theorem in the plane, Stoke's theorem, Volume integral, Gauss Divergence theorem			CO2	(07)
Tutorials: Following is tentative list of tutorials to be conducted in the tutorial class 1. Exact, reducible to exact, linear and reducible to linear differential equations. 2. Applications to differential equations. 3. LDE with constant coefficient. 4. Variation of parameters. 5. Beta and Gamma function. 6. Differentiation under integral sign. 7. Fourier series. 8. Half range Fourier series. 9. Surface integration and its applications. 10. Volume integration and its applications.					(10)
Text Books					
1.	H.K.Das, S. Chand and sons, "Advanced Engineering Mathematics",22 nd edition, 2018.				
2.	Debashis Datta , "Textbook of Engineering Mathematics New Age International Publication",6 th edition 2006.				
3.	Ravish R..Singh, Mukul Bhatt, "Engineering Mathematics A Tutorial Approach." Tata, McGraw Hill 2010.				


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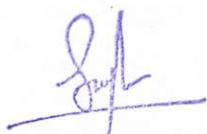
Reference Books	
1.	G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
2.	Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
3.	W. E. Boyce and R. C. DiPrima, Elementary Differential Equations and Boundary Value Problems, 9th Edn., Wiley India, 2009.
4.	S. L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.
5.	E. A. Coddington, An Introduction to Ordinary Differential Equations, Prentice Hall India, 1995.
6.	J. W. Brown and R. V. Churchill, Complex Variables and Applications, 7th Ed., McGrawHill, 2004.
7.	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010
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	PO 12	PSO 1	PSO 2	PSO 3
CO 1	2	2	1	1	-	-	-	-	-	-	-	-	-	-	-
CO 2	2	2	1	1	-	-	-	-	-	-	-	-	-	-	-
CO 3	2	2	1	1	-	-	-	-	-	-	-	-	-	-	-
CO 4	2	2	1	1	-	-	-	-	-	-	-	-	-	-	-

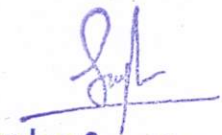
Assessment Pattern (with revised Bloom's Taxonomy)

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


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Government College of Engineering, Karad					
First Year (Sem – II) B. Tech. Information Technology					
IT3203: Object Oriented Programming					
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 : C Programming					
Course Outcomes (CO):Students will be able to					
CO1	Test and execute the programs and correct syntax and logical errors.				
CO2	Develop and execute program by using multiple concepts.				
CO3	Implement basic C++ programming concepts like inheritance, polymorphism.				
CO4	Analyze errors and program behaviour for different set of inputs.				
	Course Contents			CO	Hours
Unit 1	Object Oriented Programming: Object Oriented Programming, Concepts of object-oriented programming. Applications of OOP. Beginning with C++: simple program and its structure, functions, inline function, Defining Class & its structure.			CO1	(07)
Unit 2	Constructor: Constructor, Copy Constructor, Constructor overloading, Parameterized Constructor, Destructor. Array of objects, friend function, friend class.			CO1	(06)
Unit 3	Inheritance: Need of inheritance, Concept, public, private, protected inheritance, Single inheritance, Multiple and multilevel inheritance, Hierarchical inheritance, Hybrid inheritance, Virtual base class, Overriding of member functions, static variable, static function, Abstract class.			CO3	(09)
Unit 4	Memory Management in CPP: Pointers, basics of memory management, New and delete operators, Pointer to object, Pointer to data members, this pointer			CO2, CO4	(05)
Unit 5	Polymorphism: Need of Polymorphism, concept, Compile time polymorphism or early binding: Function over loading and operator overloading: Unary, Binary, Arithmetic operators, Relational and Logical operators, Overloading new and delete operators, Insertion and extraction operators, Run time polymorphism or late binding using virtual function, Pure virtual function.			CO3	(09)
Unit 6	Files and Streams: Concept of streams, Concept of file, Opening and closing a file, Detecting end-of-file, File modes, File pointer, Reading and writing characters, Strings and objects to the file.			CO4	(06)
Text Books					
1.	R. Lafore, “Object Oriented Programming in C++”, Galgotia Publications, 3rd Edition,2003 (Unit:1,2,3,4,5,6)				
2.	E. Balguruswamy, “Object Oriented Programming with C++”, McGraw-Hill publication, 5th Edition, 2011 (Unit: 1, 2, 3, 4, 5, 6).				
Reference Books					
1.	Bjarne Stroustrup, “C++ Programming with language”, AT & T, 2013.				
2.	Herbert Schildt, “C++: The Complete Reference”, McGraw-Hill, 4th Edition, 1995.				
3.	Cay Horstmann, Timothy Budd, “BIG C++”, Wiley India, 2006.				
Useful Links					
1.	http://nptel.ac.in/courses/106106127/41 Prof. Shankar Balachandran, IITMadras				
2.	http://www.spoken-tutorial.org NMEICT Project of Govt. Of India.				


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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	PO 12	PSO 1	PSO 2
CO 1	1	2	3	-	-	-	-	-	-	-	-	-	1	1
CO 2	-	3	2	-	-	-	-	-	-	-	-	-	2	1
CO 3	1	2	3	-	-	-	-	-	-	-	-	-	2	2
CO4	-	2	1	-	-	-	-	-	-	-	-	-	3	1

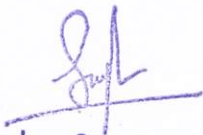
1: Slight (Low)

2: Moderate (Medium)

3: Substantial (High)

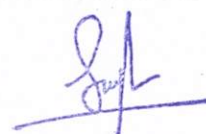
Assessment Pattern (with revised Bloom's Taxonomy)

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


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Government College of Engineering, Karad					
First Year (Sem – II) B. Tech. Information Technology					
IT3204: Data Structures					
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 : C Programming, Computer Fundamental					
Course Outcomes (CO):Students will be able to					
CO1	Write algorithms, its Pseudo code representation and analysis.				
CO2	Implement linear and non-linear data structures.				
CO3	Perform various operations on data structures like searching, sorting and their complexities.				
CO4	Analyse problem techniques, select appropriate data structure and design the algorithms for the problem.				
	Course Contents			CO	Hours
Unit 1	Algorithm Basics and Recursion: Algorithms, Pseudo code representation, Algorithm efficiency, Recursion, Conversion-Infix to Prefix , Infix to Postfix, Prefix to Infix, Prefix to Postfix, Postfix to Infix and Postfix to Prefix.			CO1	(08)
Unit 2	Sequential Representation of Linear Data Structures: Stack, Operations on stack, Applications of stack, Queue, Operations on queue, Priority queues, and Circular queue.			CO2	(07)
Unit 3	Linked Representation of Linear Data Structures: Dynamic memory allocation, Singly, doubly and circular linked list, Stack using linked list, Queue using linked list.			CO2	(06)
Unit 4	Non Linear Data Structures (Trees): Basic concept and terminology, Data structure for binary trees. Algorithms for tree traversals, Binary search trees (BST).			CO2, CO3	(06)
Unit 5	Non Linear Data Structures (Graphs): Concepts and terminology of graph, Representation of graph using adjacency matrix and adjacency list, Graph traversal techniques.			CO2, CO4	(07)
Unit 6	Searching and Sorting Techniques: Need of sorting and searching, Sequential search, Binary search, Bubble sort, Insertion sort, Selection sort, Heap sort, Merge sort, Quick sort.			CO3, CO4	(08)
Text Books					
1.	Richard Gilberg and Behrouz Forouzan, “Data structures A Pseudo code Approach with C”, Cengage Learning, 2 nd Edition, 2005(Unit:1,2,3,4,5)				
2.	Semour Lipschutz, “Data structures with C”, Schaum Series (TMH) ,1 st Edition, 2017(Unit:6)				
Reference Books					
1.	E. Horowitz, S.Sahani, S. Anderson- Freed, “Fundamentals of Data Structures in C”, SP publication, 2 nd Edition, 2008.				
2.	Yashwant Kanetkar, “Data Structures through C”, BPB Publication, 2003.				
3.	Aaron Tenenbaum, Yedidyah Langsam, “Data structure using C”, LPE, Pearson Education, 2014.				
Useful Links					
1.	http://nptel.ac.in/courses/106106130/ , IIT Madras.				
2.	http://nptel.ac.in/courses/106103069/ , IIT Guwahati.				
3.	http://nptel.ac.in/courses/106106127/ , Prof. Shankar Balachandran, IIT Madras.				


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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	PO 12	PSO 1	PSO 2
CO 1	3	2	1	-	-	-	-	-	-	-	-	-	1	1
CO 2	1	3	3	2	-	-	-	-	-	-	-	-	1	1
CO 3	1	3	2	2	-	-	-	-	-	-	-	-	1	1
CO 4	1	2	3	2	1	-	-	-	-	-	-	-	1	1

Assessment Pattern (with revised Bloom's Taxonomy)

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

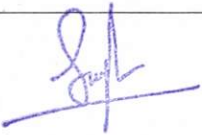


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Government College of Engineering, Karad									
First Year (Sem – II) B. Tech. Information Technology									
IT3205: Indian Knowledge Systems									
Teaching Scheme			Examination Scheme						
Lectures	-		ISE	-					
Tutorials	-		ESE	100					
Total Credits	02								
Course Outcomes (CO): Students will be able to									
CO1	Illustrate and appreciate the rich heritage that resides in our traditions								
CO2	Inculcate an understanding of the mind/voice dynamic and its function in Indian knowledge systems								
CO3	Learn to appreciate the need and importance of Sanskrit in getting to the roots of the philosophical concepts								
CO4	Being primed for practices that will prepare one for the inner-journey to discover the Self								
Course Contents									
Students should complete any one of the MOOC course certification of Indian Knowledge System and submit a copy of the certificate to Head of Department prior to ESE.									
Guidelines:									
- Duration for completion of MOOC course certification is minimum 8 Weeks. - Platform: NPTEL or SWYAM only ☐ Assessment Guideline:- The evaluation of Indian Knowledge System MOOC Course will be based on at actual score secured by the student in NPTEL or SWAYAM course certification and it will be converted to ESE score. - If the student unable to submit the NPTEL or SWAYAM completion Certificate, in such cases evaluation will be based on assignment score (60% weightage) of registered NPTEL/SWAYAM and internal evaluation (40 % weightage). - The rubrics for internal evaluation are given below.									
Government College of Engineering, Karad									
Department of _____									
A. Y. 2023-24									
Course Code :		Assessment Sheet		Class:					
Course Title :-									
Sr No	Reg .No	Name of Student	Course Title	Knowledge of Course (08 Marks)	Communication Skill (08 Marks)	Presentation Skill (08 Marks)	Content (08 Marks)	Q & A (08 Marks)	Total Marks (out of 40)
1									
2									
Guide Name and Sign.					Head of the Department				


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Government College of Engineering, Karad				
First Year (Sem – II) B. Tech. Information Technology				
IT3206: Engineering Physics Lab				
Laboratory Scheme:			Examination Scheme:	
Practical	02 Hrs/Week		ISE	25
Total Credits	01		ESE	--
Prerequisite : Basics of Physics				
Course Outcomes (CO):Students will be able to				
CO1	Verify laws of electrostatic and magneto static experimentally.			
CO2	Demonstrate a behavior of light by LASER, Ultrasonic waves and monochromatic light			
CO3	Compute required physical quantity from given data. of semiconductor, superconductor, magnetic and dielectric materials			
CO4	Demonstrate recent synthesis methods for engineering and technology.			
Course Contents				CO
Experiment 1	To study the volt-ampere characteristics of pn-junction and Zener diode, voltage regulator using Zener diode			CO1, CO3
Experiment 2	To determine the velocity of ultrasonic waves in liquid medium by interferometer.			CO2, CO4
Experiment 3	Find an object by Ultrasonic waves			CO2, CO4
Experiment 4	To calculate the divergence of LASER beam.			CO2, CO4
Experiment 5	Determination of wavelength of LASER using diffraction grating.			CO2, CO4
Experiment 6	To study magneto resistance of n-type semiconductor			CO1, CO3
Experiment 7	To study Hall effect in Semiconductor			CO1, CO3
Experiment 8	To determine the energy gap in semiconductor by four probe method			CO1, CO3
Experiment 9	To study Fundamental of Solar Energy trainer/Wind energy Trainer			CO2, CO4
Experiment 10	To study fundamentals of fiber optics using fiber optics trainer			CO2, CO4
Experiment 11	To understand the reconstruction of hologram by Holography			CO2, CO4
Experiment 12	To determine the magnetic susceptibility of the FeCl3 solution.			CO1, CO3
Experiment 13	To verify Faradays Law			CO1
Experiment 14	To verify Lenz's law			CO1
	Demonstration Experiment			
Experiment 15	To synthesize Nano particles by spray Pyrolysis/CVD method			CO4
Experiment 16	To study behavior of material with temperature by TGA/DTA.			CO4
List of Submission:				
1.	Minimum number of Experiments: 10			

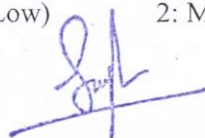
Mapping of COs and Pos:

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	3	1	-		1	1	-	1	-	2	2	-	-
CO 2	3	3	1	-	-	1	1	-	1	-	2	2	-	-
CO 3	3	3	1	-	-	1	1	-	1	-	2	2	-	-
CO 4	3	3	1	-	-	1	1	-	1	-	2	2	-	-
CO5	3	3	1	-		1	1	-	1	-	2	2	-	-

1: Slight (Low)

2: Moderate(Medium)

3: Substantial(High)



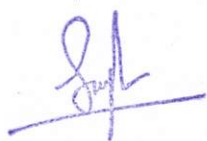
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Assessment Pattern:

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	15	15	15	15	15	15	15	15	15	15	15
Task II	05	05	05	05	05	05	05	05	05	05	05
Task III	05	05	05	05	05	05	05	05	05	05	05
ISE	25	25	25	25	25	25	25	25	25	25	25



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Government College of Engineering, Karad				
First Year (Sem – II) B. Tech. Information Technology				
FE3207 : Object Oriented Programming Lab				
Laboratory Scheme:			Examination Scheme:	
Practical	02 Hrs/week		ISE	50
Total Credits	01		ESE	25
Prerequisite : C Programming				
Course Outcomes (CO): Students will be able to				
CO1	Test and execute the programs and correct syntax and logical errors.			
CO2	Develop and execute program by using multiple concepts.			
CO3	Implement basic C++ programming concepts like inheritance, polymorphism.			
CO4	Analyze errors and program behavior for different set of inputs.			
Course Contents				CO
Implementation of following concepts				
Experiment 1	Class objects, constructor, destructor, constructor overloading.			CO1
Experiment 2	Friend function and friend class.			CO1, CO2
Experiment 3	Inline function.			CO2
Experiment 4	Single inheritance and multilevel inheritance.			CO3
Experiment 5	Multiple inheritances and hybrid inheritance.			CO3
Experiment 6	Hierarchical Inheritance.			CO3
Experiment 7	Virtual base class.			CO2
Experiment 8	Operator overloading- New and Delete operators.			CO2
Experiment 9	Function overloading.			CO3
Experiment 10	Operator overloading- Unary and Binary Operators.			CO4
Experiment 11	Operator overloading- Relational and Logical operators.			CO4
Experiment 12	Virtual and Pure virtual function.			CO4
List of Submission:				
2.	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	PO 12	PSO 1	PSO 2
CO 1	-	2	3	-	-	-	-	-	-	-	-	-	1	1
CO 2	-	3	1	-	-	-	-	-	-	-	-	-	-	2
CO 3	1	2	3	-	-	-	-	-	-	-	-	-	2	1
CO4	-	3	2	-	-	-	-	-	-	-	-	-	1	2

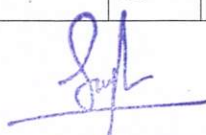
1: Slight(Low)

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	Exp 11	Exp 12	Avg
Task I	15	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	05
Task III	05	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	25


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Government College of Engineering, Karad				
First Year (Sem – II) B. Tech. Information Technology				
IT3208: Data Structures Lab				
Laboratory Scheme:			Examination Scheme:	
Practical	02 Hrs/week		ISE	50
Total Credits	01		ESE	25
Prerequisite : C Programming, Fundamental of Computing and Programming				
Course Outcomes (CO): Students will be able to				
CO1	Implement various basic data structures and its operations.			
CO2	Implement and apply the appropriate linear and non-linear data structures in problem solving.			
CO3	Develop algorithms using various searching and sorting techniques.			
Course Contents				CO
Implementation of following concepts:				
Experiment 1	Stack and Queue using array			CO1
Experiment 2	Circular queue using array			CO1
Experiment 3	Single Linked list			CO1
Experiment 4	Stack: to perform expression conversion and evaluation for infix, postfix, prefix			CO1,CO2
Experiment 5	Depth First Search (DFS) and Breadth First Search (DFS)			CO1,CO2
Experiment 6	Searching an element in the array using Linear Search			CO1,CO2
Experiment 7	Searching an element in the array using recursive Binary Search			CO1,CO2
Experiment 8	Binary Search Tree			CO3
Experiment 9	Bubble sort			CO3
Experiment 10	Selection sort			CO3
Experiment 11	Insertion sort			CO3
Experiment 12	Merge sort			CO3
List of Submission:				
	Minimum number of Experiments : 10			

Mapping of COs and POs

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

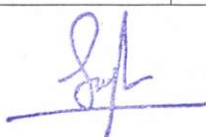
1: Slight(Low)

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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	15	15	15	15	15	15	15	15	15	15	15
Task II	05	05	05	05	05	05	05	05	05	05	05
Task III	05	05	05	05	05	05	05	05	05	05	05
ISE											



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Government College of Engineering, Karad					
First Year (Sem – II) B. Tech. Information Technology					
IT3209: Engineering Graphics Lab					
Teaching Scheme			Examination Scheme		
Lectures	02 Hrs/week		ISE	50	
Practical	02 Hrs/week		ESE	25	
Total Credits	03				
Prerequisite: Nil					
Course Outcomes (CO): Students will be able to					
CO1	Acquire skills sets to use engineering drawing instruments, symbols, conventions, title block in engineering drawing, to communicate his ideas, information and instructions.				
CO2	Dimension and annotate two-dimension & three dimensional engineering drawings				
CO3	Plan and prepare neat engineering drawing of various engineering curves, orthographic drawings of points, straight lines, planes, solids, and section of solids, isometric views				
CO4	Develop a skill of visualization to understand and read the engineering drawing				
	Course Contents			CO	Hours
Unit 1	Introduction to Engineering Drawing& Engineering Curves: Principles of Engineering Graphics and its significance, usage of Drawing instruments and accessories, layout of drawing sheets, different types of lines used in drawing practice, lettering, Introduction to SP46: 2003, Dimensioning system as per BIS, Geometric constructions. Construction of regular polygons Engineering Curves: Conic sections; Construction of Ellipse, Parabola, and hyperbola using Focus-Directrix method only; Cycloidal curves, (excluding Epicycloid, Hypocycloid), and Involute, Methods to draw tangent and normal for above engineering curves. Applications of curves in engineering.			CO1, CO2	(07)
Unit 2	Theory of Projections: Principles & theory of Projections, projection systems, projection methods, First angle & third angle method of projection, relative positions of different view, symbol of first angle and third angle; Auxiliary planes; AIP, AVP, views on auxiliary planes. Projection of Points & Lines: Projections of Points situated in any quadrant, notation system. Projection of straight line; parallel, inclined and oblique w.r.t. reference planes (RP's). Traces of lines, (Line only first quadrant should be considered).			CO1, CO3	(07)
Unit 3	Projections of Regular Planes: Types of planes, Projections of planes, positioned - parallel, inclined, and oblique <i>w.r.t.</i> HP & VP planes.			CO1, CO3	(05)
Unit 4	Projections of Regular Solids: Types of Solids, Projection of simple solids; Prisms, Pyramids, and cylinder, inclined to both reference planes.			CO1, CO3	(05)
Unit 5	Projections of Regular Sectional Solids: Sections and Sectional views of right angular Solids; Prism, Cylinder, Pyramid, Cone – Auxiliary Views; finding true shape of a section.			CO1, CO3	(03)
Unit 6	Isometric Projections: Principles of Isometric projection – Terminology, Isometric Scale, Isometric Views of standard shapes & standard solids.			CO2, CO4	(03)
	In semester Evaluation (ISE) shall be done on punctuality, interactive participation in class, laboratory work done and oral assessment.				
	ESE will be based on Oral examination on submission work of Drawing sheets, Quiz etc				


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	Lab Contents	CO
Dwg Sheet no. 1	Engineering Curves	CO1, CO2, CO3
Dwg Sheet no. 2	Projections of Points & Lines	CO1, CO2, CO3, CO4
Dwg Sheet no. 3	Projections of Planes	CO1, CO2, CO3, CO4
Dwg Sheet no. 4	Projections of Solids	CO1, CO2, CO3, CO4
Dwg Sheet no. 5	Projections of Section of Solids	CO1, CO2, CO3, CO4
Dwg Sheet no. 6	Isometric Projections of Simple solids	CO1, CO2, CO3, CO4
Dwg Sheet no. 7	Orthographic Projection of Simple components (optional)	CO1, CO2, CO3, CO4
Text Books		
1.	Bhatt N.D., Engineering Drawing: Plane & Solid Geometry, 54 th edition, 2023, Charotar Publishing House	
2.	Basant Agrawal, C M Agrawal, Engineering Graphics, 3 rd edition (2019)TMH Publication	
3.	Dhananjay A Jolhe, Engineering Drawing with an introduction to AutoCAD, TMH Publication, (2010)	
Reference Books		
1.	Cencil Jenson, Jay D. Helsel, D. R. Short, Engineering Drawing & Design, 7 th ed, 2015 TMH Pub	
2.	M. L. Dabhade, Engineering Graphics, Vision Publication	
Useful Links		
1.	https://nptel.ac.in/courses/112103019/	
2.	https://archive.nptel.ac.in/courses/112/102/112102304/	

Mapping of COs and Pos:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	3	-	-	1	-	2	-	1	1	1
CO2	2	2	-	-	2	-	-	2	-	3	-	2	1	1
CO3	3	3	-	-	3	-	-	2	-	3	-	2	1	1
CO4	2	2	-	-	2	-	-	2	-	3	-	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	Avg
Task I	15	15	15	15	15	15	15	15
Task II	05	05	05	05	05	05	05	05
Task III	05	05	05	05	05	05	05	05
ISE	25	25	25	25	25	25	25	25

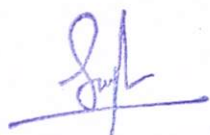


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Government College of Engineering, Karad				
First Year (Sem – II) B. Tech. Information Technology				
IT3210: National Cadet Corps(NCC)				
Teaching Scheme			Examination Scheme	
Lectures	00 Hrs/Week		ISE	50
Practical	02 Hrs/Week		ESE	-
Total Credits	01			
Prerequisite:				
Course Outcomes (CO): Students will be able to				
CO1	Develop sense of discipline, character, and brotherhood, the spirit of adventure and ideals of selfless service.			
CO2	Illustrate grace and dignity in the performance of foot drill.			
CO3	Rewrite the importance of a weapon its detailed safety precautions necessary for prevention of accidents.			
CO4	Develop awareness about different types of terrain and how it is used in battle craft.			
Course Contents				CO
Unit 1	Following list of topics and practical's are to be covered during NCC training sessions. • National Integration & Awareness • Personality Development and Leadership • Disaster Management • Social Awareness & Community Development • Health & Hygiene • Environment Awareness and Conservation • Drill • Weapon Training • Adventure Training • Introduction to Armed Forces • Obstacle Training • Military History • Introduction to Infantry Weapons and Equipment • Communication • Map reading • Field Craft and Battle Craft			CO1, CO2, CO3, CO4,
Min. 75% attendance is mandatory. NCC training will start in Semester I				
Eligibility Criteria for NCC certificate A Exam 1. The Cadet must have attended a minimum of 75% of total training periods laid down in the syllabus for the first and second years of Junior Division/Wing NCC (All Wings). 2. In order to count his previous tenure, the break in the NCC Training Tenure of the cadet prior to his appearing in the exam should not exceed more than 12 months at one time. 3. In case the break exceeds 12 months the following procedure will be followed :- A. If he has been on the unit rolls for a minimum of two years before his discharge and had attended 75% of the total periods during his NCC Tenure he will need another 36 periods of training to become eligible to appear for Certificate A examination. B. In all other cases, where above conditions are not fulfilled, the cadet must attend				



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	a minimum of 75% periods of the first and second years of training. 4. Must have attended one Annual Training Camp. 5. NCC training activity will be covered in Semester I & II.	
Text Books		
1.	"Cadet Hand Book" published by Directorate General of NCC, New Delhi under the Ministry of Defence, Govt. Of India.	
2.	"NCC Red Book", published by Directorate General of NCC, New Delhi under the Ministry of Defence, Govt. of India.	
Reference Books		
1.	"NCC Coffee Table Book", published by Directorate General of NCC, New Delhi under the Ministry of Defence, Govt. of India.	
Useful Links		
1.	https://indiancc.nic.in/	
2.	https://indiancc.mygov.in/	

Mapping of COs and POs

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	-	-	-	-	-	2	-	2	1	-	-	1	-	-	1
CO 2	-	-	-	-	-	-	-	-	2	-	-	1	-	-	-
CO 3	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-
CO 4	-	-	-	-	-	-	-	-	1	-	-	1	-	-	1

Assessment Pattern:

Marks obtained in NCC certificate 'A' exam will be converted into equivalent In-Semester Evaluation marks.

Certificate A exam will be conducted by National Cadet Corps.



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Government College of Engineering, Karad					
First Year (Sem – II) B. Tech. Information Technology					
IT3210: National Service Scheme (NSS)					
Teaching Scheme			Examination Scheme		
Lectures	00 Hrs/Week		ISE	50	
Practical	02 Hrs/Week		ESE	-	
Total Credits	01				
Course Outcomes (CO):Students will be able to					
CO1	Outline the community in which they work and their relation				
CO2	Identify the needs and problems of the community and involve them in problem-solving				
CO3	Develop capacity to meet emergencies and natural disasters				
CO4	Practice national integration and social harmony.				
CO5	Utilize their knowledge in finding practical solutions to individual and communityproblems.				
	Course Contents			CO	Hrs
	National Service Scheme: The NSS activities and allotted hours are mentioned below: 1. Blood donation Camp 8 Hrs. 2. Tree Plantation 4 Hrs. 3. Internal Cleanliness Drive 8 Hrs. 4. External Cleanliness Drive 8 Hrs. 5. Arranging Lectures on Social Issues in schools or villages 4 Hrs. 6. Demonstration of Street Plays on Social issues 4 Hrs. 7. Demonstration of Street Plays on Safety issues 4 Hrs. 8. Arranging Rally on Social issues 4 Hrs (Anti-Tobacco, Vysan Mukti etc.). 9. Celebration of National Days (As per NSS list) 4 Hrs. 10. Arrangement of free medical checkup camp in villages 4 Hrs. 11. Arrangement of environment protection awareness camp 4 Hrs. 12. Arrangement of veterinary awareness camp 4 Hrs. 13. Participation in disaster management training 8 Hrs. 14. Arrangement of water conservations awareness camp 8 Hrs. 15. Arrangement of rain water harvesting awareness camp 8 Hrs. 16. Assisting local administration for law and order, regulation, social issues. 8 Hrs. 17. Any other activity as decided by Hon. Principal / Program Officer 8 Hrs from time to time .			CO1, CO2, CO3, CO4, CO5	(30)
	Instructions: 1) The Students will have to complete for a total period of 30 hours activities (in one Semester) OR Participation in seven days residential camp with completion certificate of NSS camp. 2) NSS Volunteer has to complete 30 hours NSS activities mentioned in above				


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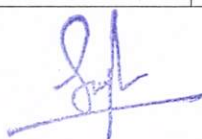
	curriculum. NSS volunteer has to prepare and submit NSS activity report of 30 hours to NSS Coordinator. 3) The In Sem Evaluation (ISE) will be conducted by NSS Coordinator based on the attendance, overall performance and the report.	
Reference Books:		
1.	National Service Scheme Manual, Government of India.	
2.	Training Programme on National Programme scheme, TISS.	
3.	Orientation Courses for N.S.S. Programme officers, TISS.	
4.	Case material as Training Aid for field workers, Gurmeet Hans.	
5.	Social service opportunities in Hospitals, Kapil K.Krishan, TISS.	
6.	Social Problems in India, Ram Ahuja.	
7.	National Service Scheme Manual (Revised), Government of India, Ministry of Youth Affairs and Sports, New Delhi. 2006	
8.	University of Mumbai National Service Scheme Manual, 2009	
9.	Avhan Chancellor's Brigade - NSS Wing, Training Camp on Disaster Preparedness Guidelines, March, 2012.	
10.	Rashtriya Seva Yojana Sankalpana - Prof. Dr. Sankey Chakane, Dr. Pramod / Pabrekar, Diamond Publication, Pune.	
11	National Service Scheme Manual for NSS District Coordinators, National Service Scheme Cell, Dept. of Higher and Technical Education, Mantralaya.	
12	Annual Report of National Service Scheme (NSS) published by Dept. of Higher and Technical Education, Mantralaya.	
13	NSS Cell, Dept. of Higher and Technical Education, Mantralaya, UTKARSHA - Socio and Cultural Guidelines.	
14	Purushottam Sheth, Dr. Shailaja Mane, National Service Scheme	
Useful Links		
1.	https://www.youtube.com/watch?v=3o40NbNLoWQ	
2.	https://www.youtube.com/watch?v=paJK5X6zql8&list=PLp4YWOW_lIESHogw-coZo7PQdYliF-msj	
3.	https://www.youtube.com/watch?v=paJK5X6zql8&list=PLp4YWOW_lIESHogw-coZo7PQdYliF-msj&index=1	

Mapping of COs and POs

PO \ CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	1	1	-	-	-	1	1	1	1	-	-	-	1	1
CO 2	1	1	-	-	-	1	1	1	1	-	-	-	1	1
CO 3	1	1	-	-	-	1	1	1	1	-	-	-	1	1
CO 4	1	1	-	-	-	1	1	1	1	-	-	-	1	1
CO5	1	1				1	1	1	1				1	1

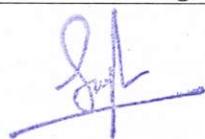
Assessment Pattern: (with revised Bloom's Taxonomy)

Knowledge Level	MSE	ISE	ESE
Remember	-	-	-
Understand	-	-	20
Apply	-	-	10
Analyse	-	-	10
Evaluate	-	-	10
Create	-	-	-
Total	-	-	50

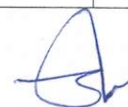

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Government College of Engineering, Karad					
First Year (Sem – II) B. Tech. Information Technology					
IT3210: Community Service and Practices (CSP)					
Teaching Scheme			Examination Scheme		
Lectures	00 Hrs/Week		ISE	50	
Practical	02 Hrs/Week		ESE	-	
Total Credits	01		Duration of ESE	-	
Course Outcomes (CO): Students will be able to					
CO1	Understand the community needs in which they are living.				
CO2	Identify the problems of the community and help to solve them.				
CO3	Apply technical knowledge of respective field to train local community.				
CO4	Practice national integration and social harmony.				
	Course Contents			CO	Hours
	Community Service and Practices (CSP): 1. Student has to register for CSP with department coordinator. 2. He/she has to complete one of the following two modules. 3. He/she has to obtain certificate of participation from Head of the department to that effect.				
	MODULE I: The institute has signed MoU with NASSCOM for implementation of digital literacy program (under NDLM - National Digital Literacy Mission). The program shall cover training of school children or village youths on one of the 7 modules designed by NASSCOM such as internet, mobile banking, e-commerce, e-business, use of media like WhatsApp/ linkedin etc. The course details are provided by NASSCOM. The course work of each module consists of presentation of readymade power point slides as a theory and separate practice sessions. The module shall be followed by test and joint certification of successful candidates (institute and NASSCOM). The theory sessions shall be conducted in the respective schools and the practical may be conducted in schools subject to availability of computational facility OR in the computer centre of our institute on weekend. The total duration of the course shall be between 40 to 60 hours. The students shall visit schools covering 20 km surrounding area (rural and municipal schools) and register the school students. The target for each student shall be delivery and certification of one of the modules to a group of 6 school students. Travelling allowance for travel by bus (bus ticket) or sleeper class shall only be admissible to the students at actual subject to prior sanction of Hon. Principal for the activity.			CO1, CO2, CO3, CO4	40 to 60
	MODULE II He/she should participate in all/few of the following activities and complete at least 60 hours of activities for technology transfer to community within 20 km. The activities shall be declared by respective Head of the department. The list of different CSP activities to be conducted under this module shall be but not limited to the following. The activity has to be conducted under the institute banner and counting of its equivalent duration shall be as Indicated against each. He/she should collect total 60 Hours from CSP activities. 1. Two wheeler maintenance 16 Hrs. 2. Motor cycle repairing 16 Hrs. 3. Electrical wiring 16 Hrs.			CO1, CO2, CO3, CO4	60



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4. Plumbing 16 Hrs.		
5. Carpentry 16 Hrs.		
6. Computer Hardware maintenance 16 Hrs.		
7. Radio / T.V. repair 16 Hrs.		
8. Rain water harvesting 16 Hrs.		
9. Roof water harvesting 16 Hrs.		
10. Electric safety 16 Hrs.		
11. Electrical Safety 16 Hrs.		
12. Constructional Safety 16 Hrs.		

Reference Books:

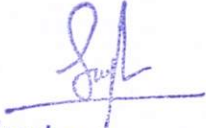
1.	Community Service and Practices Manual, Government of India.
2.	Training Programme on National Programme scheme, TISS.
3.	Case material as Training Aid for field workers, Gurmeet Hans.
4.	Social service opportunities in Hospitals, Kapil K.Krishan, TISS.
5.	Social Problems in India, Ram Ahuja.
6.	National Service Scheme Manual (Revised), 2006 Government of India, Ministry of Youth Affairs and Sports, New Delhi.
7.	University of Mumbai National Service Scheme Manual, 2009
8.	Avhan Chancellor's Brigade - NSS Wing, Training Camp on Disaster Preparedness Guidelines, March, 2012.
9.	Rashtriya Seva Yojana Sankalpana - Prof. Dr. Sankey Chakane, Dr. Pramod / Pabrekar, Diamond Publication, Pune.
10.	National Service Scheme Manual for NSS District Coordinators, National Service Scheme Cell, Dept. of Higher and Technical Education, Mantralaya.
11.	Annual Report of National Service Scheme (NSS) published by Dept. of Higher and Technical Education, Mantralaya.
12.	NSS Cell, Dept. of Higher and Technical Education, Mantralaya, UTKARSHA - Socio and Cultural Guidelines.
13.	Purushottam Sheth, Dr. Shailaja Mane, National Service Scheme

Useful Links

1.	https://www.youtube.com/watch?v=3o40NbNLoWQ
2.	https://www.youtube.com/watch?v=paJK5X6zqI8&list=PLp4YWOW_IIESHogw-coZo7PQdYliF-msj
3.	https://www.youtube.com/watch?v=paJK5X6zqI8&list=PLp4YWOW_IIESHogw-coZo7PQdYliF-msj&index=1

Mapping of COs and POs

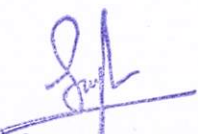
PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1		1	-	-	-		1	1		1	-	-	1	1
CO 2	1	1	-	-	-	1	1	1	1	1	-	-	1	1
CO 3	1	1	-	-	-	2	1	1	1	1	-	-	1	1
CO 4	1	1	-	-	-	1	1	1	1	1	-	-	1	1
CO 5	1	1				1		1	1				1	1


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Assessment Pattern: (with revised Bloom's Taxonomy)

Knowledge Level	MSE	ISE	ESE
Remember	-	-	10
Understand	-	-	10
Apply	-	-	20
Analyse	-	-	10
Evaluate	-	-	-
Create	-	-	-
Total	-	-	50


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Government College of Engineering, Karad					
First Year (Sem – II) B. Tech. Information Technology					
IT3210: E-Cell					
Teaching Scheme		Examination Scheme			
Lectures	00 Hrs/Week	ISE	50		
Practical	02 Hrs/Week	ESE	-		
Total Credits	01				
Course Outcomes (CO):Students will be able to					
CO1	Apply various schemes supporting entrepreneurship.				
CO2	Use various entrepreneurship models.				
CO3	Identify qualities of entrepreneurs.				
CO4	Utilize their knowledge in finding practical solutions to individual and communityproblems.				
	Course Contents			CO	Hrs
	E-Cell Activities: The E-Cell activities and allotted hours are mentioned below: 1. Orientation and Motivation 2. Opportunity assessment 3. Kick starting the Entrepreneurial campus 4. Business planning workshops 5. Prototype to commercialization- drafts preparation 6. Market Analytics 7. Team Building 8. Managing funds/ entrepreneurship finance 9. Social Entrepreneurship locally in the area			CO1, CO2, CO3, CO4	(30)
	Instructions: 1) The Students will have to complete for a total period of 30 hours activities (in one Semester). 2) The In Sem Evaluation (ISE) will be conducted by Coordinator based on the attendance, overall performance and the report. 3) E- Cell consists of faculty member's act as the facilitator and students as the active members. The student's members for the E-cell will be selected on the basis of their interest and their willingness to work for E-cell voluntarily. E-cell team will prepare an activities mentioned above for the semester.				
Reference Books:					
1.	Dr. Gupta and Dr. Srinivasan, Entrepreneurship development in India, 2022.				
2.	Vasant Desai, Dynamics of Entrepreneurial Development and Management, 2001.				
3.	Sarugadharan and Resia Begum, Women Entrepreneurship; institutional support and problems.				
4.	M.W.Deshpande, Entrepreneurship of small Scale Industries.				
5.	D.L. Saxon and RW Smilor (eds), The Art and Science of Entrepreneurs.				
6.	Venkateshwara Rao and Udai Pareek,(Eds)Developing Entrepreneurship-A Handbook.				


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7.	Ravi J. Mathai, Rural Entrepreneurship A Frame Work in Development Entrepreneurship –A handbook.
Useful Links	
1.	https://gpdaman.in/entrepreneurship-development-cell-edc/
2.	https://www.ecell.in/2020/ IIT Bombay.
3.	https://www.ecelliitk.org/ IIT Kanpur

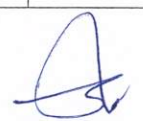
Mapping of COs and POs

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	1	1	-	-	-	1	1	1	1	-	-	-	1	1
CO 2	1	1	-	-	-	1	1	1	1	-	-	-	1	1
CO 3	1	1	-	-	-	1	1	1	1	-	-	-	1	1
CO 4	1	1	-	-	-	1	1	1	1	-	-	-	1	1
CO5	1	1				1	1	1	1				1	1

Assessment Pattern: (with revised Bloom's Taxonomy)

Knowledge Level	MSE	ISE	ESE
Remember	-	-	-
Understand	-	-	20
Apply	-	-	10
Analyse	-	-	10
Evaluate	-	-	10
Create	-	-	-
Total	-	-	50


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Government College of Engineering, Karad				
First Year (Sem- I) B. Tech				
FEXXXX: Makers Space Laboratory I				
Laboratory Scheme			Examination Scheme	
Practical	04 Hrs/week		ISE	75
			ESE	25
Total Credits	02			
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)		Concrete testing equipment Soil testing equipment Aggregate testing tools Surveying instruments (Total station) , Rebar bending & cutting , Model making materials , Water flow & structure models ,Structural model making , Material testing , Surveying practice , Transportation models , Water resource models , Sustainable construction , BIM basics (3D models)		
Module 2 (Mechanical Domain)		Mechanical fabrication Assembly practice , Structural model making, Mechanism development , Maintenance practice, Handheld tools, CAD/CAM software, 3D printers, Prototype fabrication, Model development , Product iteration , Component manufacturing , Rapid testing		
Module 3 (Electrical Domain)		Electrical Safety, Tools and Basics Circuits, Electrical Machines and Drives, Solar kits, Wind turbine models, Energy monitoring systems, EV components, Battery testing systems, Renewable energy experiments , Energy audits, Sustainable product design, EV prototype development , Green building models		
Module 4 (E&TC Domain)		Arduino kits , Raspberry Pi boards , Sensors & actuators Breadboards , Oscilloscopes , Soldering stations, Power supplies, Embedded systems, PCB designing (Power supply designing), IoT basics , Sensor interfacing, Embedded systems, Smart automation		
Module 5 (IT Domain)		Programming systems, AI software tools, MATLAB / Python environment, Simulation software, High-performance PCs, Coding practice, AI model development , Data visualization, Algorithm development, Digital twin simulation		
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.		


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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	3	1	1	1	3	1	1	--	1	--	--
CO2	3	3	2	2	2	1	2	--	2	1	--
CO3	1	1	1	2	2	--	1	1	1	3	2
CO4	--	1	1	--	1	--	1	2	3	3	2

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

Knowledge Level	ISE	ESE
Remember	-	-
Understand	15	5
Apply	20	5
Analyse	10	5
Evaluate	10	5
Create	20	5
TOTAL	75	25

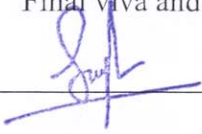


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First Year (Sem- II) B. Tech			
FEXXXX: Makers Space Laboratory II			
Laboratory Scheme		Examination Scheme	
Practical	04 Hrs/week	ISE	50
		ESE	50
Total Credits	02		
Prerequisite: Makers Space Laboratory I			
Course Outcomes (CO): Students will be able to			
CO1	Apply engineering knowledge to execute multidisciplinary projects.		
CO2	Demonstrate effective teamwork and engineering management skills.		
CO3	Develop and implement real-world engineering solutions.		
CO4	Analyze and solve practical engineering problems using multidisciplinary approaches.		
Course Contents			
The main aim of this course is to develop among students the essential qualities of creativity, innovation, critical thinking, collaborative learning, leadership, and engineering problem-solving skills through hands-on multidisciplinary projects and prototype development. Students shall work in groups consisting of a maximum of FIVE students. The groups are encouraged to be multidisciplinary and may include students from different engineering branches. Each group shall identify a real-life or societal problem and develop an innovative technological solution in the form of a prototype, model, system, software, process, or product. The developed solution must demonstrate novelty, practical utility, sustainability, and engineering application. The steps involved in completion of the project shall include, but are not limited to: 1. Problem Identification and Need Analysis: Through, Observation of day-to-day problems, Field visits and surveys, Literature review, Interaction with users/community, Identification of societal, environmental, industrial, or technological challenges 2. Ideation and Concept Development: Including, Brainstorming and idea generation, Design thinking methodologies, Feasibility analysis, Conceptual design and workflow preparation, Selection of suitable materials/components/tools 3. Design and Prototype Development: Engineering design and planning, CAD modeling/sketching/block diagrams, Fabrication and assembly, Programming and system integration, Sensor interfacing and automation, Development of software/hardware systems, Testing of subsystems 4. Testing, Validation and Improvement: Prototype testing and debugging, Performance evaluation, Validation through experimentation, User feedback and modifications Optimization and refinement 5. Presentation and Documentation: Preparation of technical report, Cost estimation and feasibility study, Prototype demonstration, Poster and presentation preparation, Final viva and exhibition			


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Task	Activity
Task 1	Introduction to multidisciplinary project development, team formation, identification of societal and industrial problem statements.
Task 2	Literature survey, problem analysis, brainstorming sessions, and selection of project theme.
Task 3	Requirement analysis, preparation of functional block diagram, project planning, and task allocation among team members.
Task 4	Conceptual design development, selection of components, feasibility analysis, and preparation of preliminary design report.
Task 5	Mechanical system design, CAD modeling, and structural planning of the proposed system.
	Electrical and electronic subsystem design including sensors, actuators, power supply, and interfacing circuits.
	Embedded system development, microcontroller programming, communication protocol implementation, and software architecture design.
	Procurement of components, fabrication planning, PCB preparation, and hardware assembly initiation.
	Prototype fabrication, subsystem integration, wiring, assembly, and implementation of software modules.
Task 6	Testing of individual modules, debugging, calibration, troubleshooting, and validation of subsystem functionality.
Task 7	Complete system integration, multidisciplinary coordination, and implementation of automation or IoT features.
Task 8	Performance evaluation, optimization, testing under different operating conditions, and reliability assessment.
Task 9	Preparation of technical documentation, project report, presentation slides, posters, and student portfolio compilation.
Task 10	Final project demonstration, viva voce examination, prototype exhibition, and evaluation by faculty/industry experts.

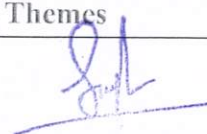
Experiment Completion Reports

Each experiment report shall contain:

1. Project Title
2. Domain Introduction
3. Motivation
4. Design Methodology
5. Implementation and Modeling
6. Testing and Development
7. Conclusion
8. Reference
9. Presentation
10. Viva Questions

Maker Lab II – Common Multidisciplinary Project

Project Themes


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1. Industry 4.0
2. Smart Agriculture
3. Smart Energy Systems
4. Smart Campus
5. Sustainable Infrastructure
6. Healthcare Devices
7. Robotics and Automation
8. Smart Transportation
9. Disaster Management Systems

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	3	2	3	2	2	1	1	--	2	1	1
CO2	1	1	1	1	1	1	1	2	3	3	3
CO3	3	3	3	3	2	2	2	1	2	2	2
CO4	3	3	2	3	2	1	2	1	2	1	1

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

Rubrics for Practical Evaluation

Criteria	Excellent	Good	Average	Poor
Preparation	4	3	2	1
Technical Execution	4	3	2	1
Safety Practices	4	3	2	1
Observation and Analysis	4	3	2	1
Documentation	4	3	2	1

Rubric-Based Evaluation Sheet

Evaluation Parameter	Max Marks	Obtained	Remarks
Preparation	10		
Execution	10		
Observation	10		
Documentation	10		
Viva	10		
Total	50		

Evaluation Scheme

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


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