Government College of Engineering, Karad
First Year B. Tech. Electrical Engineering
EE3101-Engineering 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

Course Outcomes (CO): After completion of course the Students will be able to	
CO1	Understand fundamental of Chemistry relevant to Engineering field.
CO2	Understand construction, working and applications of battery.
CO3	Equipped with basic knowledge of polymer reinforced composites, applications of semiconductor conducting polymers in energy harnessing.
CO4	Acquire Basic knowledge of Nanochemistry to appreciate its applications in the field of Medicine, data storage devices and electronics.
CO5	Apply the principles of green chemistry in designing alternative reaction methodologies to minimize hazards and environmental degradation.

	Course Contents	CO	Hrs
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 ofPoly 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 ofPoly lactic acid. Applications of biodegradable polymers in medical industry.	CO1 CO3	(07)
Unit 4	**Environmental & Green Chemistry:** Introduction, definition, Major environmental pollutants, Air, water and noise pollution. Optimum levels of pollution. Significance and determination of COD and BOD. Solid waste treatment of collection of NKP. Greenhouse effect and global Warming. eWaste. Radioactive pollution.Basic principles of greenchemistry. Various green chemical approaches – Microwave synthesis, Bio catalyzedreactions, Phase transfer catalysis.	CO1 CO5	(07)
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	CO1 CO5	(07)

		oxide fuel cell. Hydrogen cells, Photo conductive cells, Photo voltaic cells, characterization– super capacitor – applications rechargeable battery – applications – maintenance free battery – applications		
Unit 6		Nanomaterials:- Introduction, Nanomaterials- preparation of CNT by different methods, CNT properties and applications, size dependent properties (Surface area, Electrical, Optical, Catalytic andThermal 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, DhanpatRai Publications, New Delhi, 20th Edition, 2020.
3.	S SDara -A Text book of Engineering Chemistry, S Chand & Company Ltd., 15th Edition, 2020.
4.	B. S. Jai Prakash, R. Venugopal, Sivakumaraiah&PushpaIyengar.,- "Chemistry for Engineering Students", Subash Publications, Bangalore. 10th Edition, 2020.
5.	"Modern Electrochemistry 2A: Fundamentals of Electrodics" by J O'M Bockeris and M G-Aldeco
6.	Handbook of Carbon Nanotubes Jiji Abraham, Sabu Thomas, NandkumarKalarikkal

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

Head of Department
Electrical Engineering Department
Government College of Engineering, Karad.

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	-	-

Assessment Pattern: (with revised Bloom's Taxonomy)
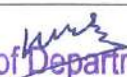
Knowledge Level	MSE	ISE	ESE
Remember	5	8	20
Understand	5	4	10
Apply	5	4	10
Analyse	5	4	20
Evaluate	-	-	-
Create	-	-	-
Total	20	20	60

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Government College of Engineering, Karad

First Year B. Tech Electrical Engineering

EE3102: Linear algebra and Calculus

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

Course Outcomes: After completion of the course the student 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, Jacobian and their applications.
CO4	Apply vector calculus for 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	(7)
Unit 2	**Eigen Values and Eigen Vectors:** Eigen values and Eigenvectors and their properties, Cayley-Hamilton Theorem (without proof), Powers of matrix, diagonalization of matrices, Orthogonal transformation.	CO1	(7)
Unit 3	**Expansion of Functions and Indeterminate Forms:** Taylor's Series, Maclaurin's series, expansion using standard expansions, Indeterminate forms, L-Hospital rule, Evalution of limits and applications.	CO2	(7)
Unit 4	**Partial Differentiation:** Partial derivatives, Homogeneous functions and Euler's theorem, Composite function, total derivative, Applications to partial differentiation; Errors and Approximations	CO3	(7)
Unit 5	**Jacobian:** Properties,Jacobian of implicit function, Maxima and minima of function of two variables, Lagrange's method of undermined multipliers	CO3	(7)
Unit 6	**Vector Calculus:** 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	(7)

Tutorials: Following is tentative list of tutorials to be conducted in the tutorial class based on-		(10)

Tutorials: Following is tentative list of tutorials to be conducted in the tutorial class based on-

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. Errors and Approximations.

9. Jacobian of implicit function.

10. Directional Derivatives, Curl and Divergence of vector point function.

Text Books

1.	H.K.Das, S. Chand and sons, Advanced Engineering Mathematics22^{nd} edition, 2018.
2.	DebashisDatta Textbook of Engineering MathematicsNew Age International Publication, 6th edition 2006.
3.	Ravish R..Singh, MukulBhatt.,Engineering Mathematics A Tutorial Approach, 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.	B. S. Grewal, Higher Engineering Mathematics, 43th edition, Khanna publication, New Delhi 2013.
7.	N P Bali and Dr.ManishGoyal, Textbook of Engineering MathematicsLaxmi publication 12th edition 2020.

Useful Links

1.	http://www.nptel.iitm.ac.in
2.	www.ocw.mit.edu

Head of Department
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Goverment College of Engineering, Karad

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	-	-	-	-	-	-	-	-	-	-	-

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

PLEASE NOTE: *Maximum 3-4 course outcomes are recommended to include in the curriculum. Use Bloom's taxonomy to define course outcomes. Refer AICTE new model curriculum for the same, if required.*

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

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	Understand fundamentals of semiconductor devices
CO2	Demonstrate knowledge of diode circuits.
CO3	Understand transistor circuits.
CO4	Acquire knowledge of MOSFET

	Course Contents	CO	Hours
Unit 1	**Introduction to Semiconductor Devices :** N-Type and P-Type Semiconductors, The PN Junction. Diode, PNP and NPN transistors, MOSFET and SCR constructional features only	CO1	(08)
Unit 2	**Types of Diodes** Ideal versus practical diodes, resistance levels, diode equivalent circuits, transition and diffusion capacitance, reverse recovery time, diode specification sheet, zener diode, Light Emitting diode, Tunnel diode, schottky diode, varicap diode	CO1	(07)
Unit 3	**Diode Circuits :** Diode Models, Half-Wave Rectifiers, Full-Wave Rectifiers. Clippers, Clampers, Zener Diode as voltage regulators, Voltage multiplier circuits, Practical Applications of diode circuits.	CO2	(05)
Unit 4	**Transistors:** Bipolar Junction Transistor Introduction, Transistor construction, Operation, Common-base configuration & characteristic, Transistor Amplifying action, Common-Emitter configuration & characteristic, Commoncollector configuration & characteristic, Limits of operation, study of Transistor data sheet	CO1	(07)
Unit 5	**Transistor Amplifier Circuits :** Class A amplifier, Transformer-Coupled Class A amplifier, Class B amplifier operation, Class B amplifier circuits, Amplifier distortion, Class C and Class D amplifier. Push Pull Ampilfier.	CO3	(06)
Unit 6	**MOS Field-Effect Transistors Device Structure and Physical Operation**: Current-Voltage Characteristics, MOSFET Circuits at DC, The MOSFET as an Amplifier and as a Switch, Biasing in MOS Amplifier Circuit.	CO4	(07)

Text Books

1.	Thomas. L. Floyd ,"Electronics Devices" , 9th Edition, Pearson, 2021. (Unit 1,2)
2.	Albert Malvino& David J. Bates, "Electronic Principles", Tata McGraw Hill, 7th Edition 2007
3.	Floyd, "Electronic Devices", PHI, 7th Edition.

Reference Books

1.	Sedra, Smith, 'Microelectronic Circuits', Oxford University Press, fifth edition, 2004.
2.	Paul Horowitz and Winfield Hill, 'The art of electronics', Cambridge university press, third edition, 2011.

Useful Links

1.	http://nptel.ac.in/courses/117105080/Prof. D. Roychoudhury IIT Kharagpur.
2.	http://nptel.ac.in/courses/117106086/Prof. S. Srinivasan IIT Madras.
3.	https://onlinecourses.nptel.ac.in/noc21_ee32/preview Prof. HardikJeetendraPandyaIISc 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	4	20
Understand	5	4	-
Apply	5	4	10
Analyse	-	4	20
Evaluate	5	4	10
Create	-	-	-
TOTAL	20	20	60

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Government College of Engineering, Karad						
First Year (Sem – I) B. Tech. Electrical Engineering						
EE3104: 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	Understand 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.	YashvantKanetkar, "Let us C", BPB publications, 2004. (Unit 1,2,3,4,5,6)

Reference Books

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

Useful Links

1.	http://cse02-iiith.vlabs.ac.in/

| 2. | https://www.digimat.in/nptel/courses/video/106105171/L01.html Prof. AnupamBasu, |
| 3. | https://archive.nptel.ac.in/courses/106/104/106104128/SatyadevNandkumar |

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	4	20
Understand	5	4	-
Apply	5	4	10
Analyse	-	4	20
Evaluate	5	4	10
Create	-	-	-
TOTAL	20	20	60

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Government College of Engineering, Karad				
First Year (Sem – I) B. Tech. Electrical Engineering				
EE3105: Design Thinking				
Teaching Scheme			**Examination Scheme**	
Lectures	01 Hrs/week		MSE	--
Practical	02Hrs/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	

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.	BalaRamadurai, "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 YourOrganization".
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. BalaRamadurai/ 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)

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

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Government College of Engineering, Karad				
First Year B. Tech. Electrical Engineering				
EE3106-Applied Chemistry Lab				
Laboratory Scheme:			**Examination Scheme:**	
Practical	2 Hrs/Week		**ISE**	50
Total Credits	1		**ESE**	-

Course Outcomes (CO): After completion of course the 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	To Determine the total hardness of water.	CO1,CO3,CO4
Experiment 2	To Determine Calorific Value of Coal sample.	CO1,CO3,CO4
Experiment 3	To 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	To 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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	2	-	-	-	2	2	-	1	-	-	1	-	-
CO 2	3	2	-	-	-	2	2	-	1	-	-	1	-	-
CO 3	3	2	-	-	-	2	2	-	1	-	-	1	-	-
CO 4	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	Avg
Task I	15	15	15	15	15	15	15	15	15	15	
Task II	05	05	05	05	05	05	05	05	05	05	
Task III	05	05	05	05	05	05	05	05	05	05	
ISE											

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Government College of Engineering, Karad					
First Year (Sem – I) B. Tech. Electrical Engineering					
EE3107 : Programming for problem solving Lab					
Laboratory Scheme:				Examination Scheme:	
Practical	02 Hrs/week			ISE	25
Total Credits	01			ESE	25
Prerequisite : Computer fundamentals					
Course Outcomes (CO):Students will be able to					
CO1	Understand 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

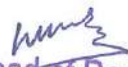| PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1	3	-	-	1	-	1	1	-	-	-	-	-	-	2
CO 2	1	2	-	1	-	1	1	-	-	-	-	-	1	-
CO 3	-	1	3	2	1	1	-	-	-	-	-	-	2	-
CO 4	-	1	2	3	-	1	1	-	-	-	-	-	2	-

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

Head of Department
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Government College of Engineering, Karad.

Government College of Engineering, Karad
First Year B. Tech. Electrical Engineering
EE3108 : Professional Communication Skills

Laboratory Scheme				Examination Scheme	
Lecture	1Hrs/week			CA	50
Practical	2Hrs/week			ESE	25
Total Credits	2				

Course Outcomes (CO): After completion of the course student 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**- ReadingReaders 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.	KulBhushan Kumar, Effective Communication Skills. Khanna Book Publishing, 2022.
3.	Practical English Usage. Michael Swan. OUP. 1995. 4. Remedial English Grammar. F.T. Wood. Macmillan.2007 5. On Writing Well. William Zinsser. Harper Resource Book. 2001 6. Study Writing. Liz Hamp-Lyons and Ben

		Heasly. Cambridge University Press. 2006. https://www.coursera.org/specializations/improve-english	
List of Submission			
	1	Total number of Experiments: Minimum 10	
	2	Total number of sheets: NA	
	3	Project/Dissertation Report: NA	
	4	Seminar report: NA	
	5	Field Visit Report: NA	

Mapping of COs and Pos

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

Assessment Pattern(with revised Bloom's Taxonomy)

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

Head of Department
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Government College of Engineering, Karad					
First Year B. Tech. Electrical Engineering					
EE3109 : Electrical Workshop					
Teaching Scheme			**Examination Scheme**		
Lectures	----				
Tutorials	----				
Practical	2 Hrs/Week		ISE/CA	50	
Total Credits	01		ESE	25	
			Duration of ESE	03Hrs	

Course Outcomes (CO)

Students will be able to

1.	Appreciate various types of Electrical wiring.
2.	Understand importance of earthing.
3.	Demonstrate knowledge of various components used for control panel.
4	Develop PCB

	Course Contents	Hours
Experiment 1	**Prepare test board/extension board and mount accessories like lamp holders, various switches, sockets, MCB, indicating lamp etc.** • Identify various electrical accessories and their ratings • Select correct size of board to mount specified accessories • Position the accessories and mount them on board • Wire up and test the test board/extension board	CO1
Experiment 2	**Testing/Fault detection of domestic/industrial wiring and repair** • Detect and repair open circuit fault in domestic/industrial wiring • Detect and repair short circuit fault in domestic/industrial wiring • Detect and repair earth fault in domestic/industrial wiring • Prepare flowchart for location and rectification of faults in wiring installations	CO1
Experiment 3	**Practice wiring of 415 V, 3 HP, 3-phase induction motor as per IE rules** • Read and interpret name plate details of motor • Determine the size of cable • Select suitable ICTP/MCB, DOL starter and other accessories • Calculate the size and length of conduit. • Make connections, adjust the overload relay as per motor rating • Start and stop the motor using starter	CO1
Experiment 4	**Prepare plate/pipe earthing and measure earth resistance** • Prepare the plate/pipe for earthing as per IS	CO2

		• Prepare the earthing pit as per required standard • Install the plate/pipe in earthing pit • Measure the earth resistance using earth tester	
Experiment 5	**Practice on winding of small transformer** • Dismantle the transformer core • Measure and determine the size of winding wire for primary and secondary winding • Take the dimensions of a bobbin and prepare the bobbin from suitable materials • Wind the primary and secondary windings using winding machine • Stack the laminations and fasten them • Terminate the winding ends in a terminal board • Test the transformer for insulation, transformation ratio and performance	CO1
Experiment 6	**Practice on winding of 3-phase induction motor** • Dismantle the motor • Read, record and interpret the winding data for a 3-phase squirrel cage induction motor • Strip the old winding from the stator • Prepare and provide slot insulation • Prepare and lay the coils • Make end connections and terminate the lead wire • Assemble and test the motor for performance	CO1
Experiment 7	**Make a printed circuit board for small electronic circuit** • Prepare the layout of PCB and transfer it on copper clad board • Punch component mounting holes • Paint and etch copper clad board • Drill holes, mount and solder components • Test the circuit	CO4
Experiment 8	**Control panel wiring for forward reverse control/star-delta starter/sequential control of motors** • Draw power and control circuit diagrams • Design layout of control cabinet • Mount various control elements like contactors, relays, timers, circuit breakers, sensors, measuring instruments etc. • Mount DIN rail and arrange wiring by routing, bunching and tying • Test the control panel	CO3
Experiment 9	**Installation and connection of inverter/UPS with battery for domestic wiring** • Select rating of inverter/UPS for given load and backup • Select suitable place for installation of inverter and batteries in the house • Install inverter, batteries and make connection to the load • Test the installation under ON/OFF condition of supply	CO1

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
CO 1	3	2	-	-	-	-	-	-	-	-	-	-	-
CO 2	3	3	-	-	-	-	-	-	-	-	-	-	-
CO 3	3	3	-	-	-	-	-	-	-	-	-	-	-
CO 4	2	2	-	-	-	-	-	-	-	-	-	-	-

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Government College of Engineering, Karad					
First Year B.Tech. Electrical Engineering					
EE3110 : Yoga					
Laboratory Scheme:				Examination Scheme:	
Practical	2 Hrs/Week			ISE	50
Total Credits	1			ESE	00

Course Outcomes(CO): After completion of the course students will be able to

CO1	Understand 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 is only the guidelines to the instructor:
 	
• योगाचाइतिहास: योगसूत्रग्रंथ, पतंजलीमुनी.
• अष्टांगयोग:
  १. यम: अहिंसा,सत्य,अस्तेय,ब्रम्हचर्य,अपरिग्रह
  २. नियम:शौच,संतोष,तपास,स्वाध्याय,ईश्वरप्रणीधान
  ३. आसन: विविध स्थितीतील आसने
  ४. प्राणायाम : विविध प्रकार
  ५. प्रार्थना
  ६. धारणा: एकाग्र चित्त
  ७. ध्यान
  ८. समाधी
 	
वरील अष्टांग योगाचे थोडक्यात महत्व
 	
• सूर्यनमस्कार: महत्व व फायदे
• प्रात्यक्षिक : प्रार्थना,सूर्यनमस्कार,आसने,प्राणायाम व ध्यान याचा सराव
	CO1
	CO2
	CO3
	CO4

Reference Books:	
1.	Nagendra,H.R.&Nagarathna,R.(2002).SamagraYogaChikitse.Bengaluru: SwamiVivekanandaYogaPrakasana.
2.	Kumar,Ajith.(1984)YogaPravesha.Bengaluru:RashtrothannaPrakashana.
3.	D.MJyoti,YogaandPhysicalActivities(2015)lulu.com3101,Hillsborough,NC27609,UnitedStates.
4.	Uppal,A.K.(1992).PhysicalFitness.NewDelhi:FriendsPublication.

Mapping of COs and Pos:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	2	2	2	3	2	-	-	-	-
CO2	-	-	-	-	-	2	2	2	3	2	-	-	-	-
CO3	-	-	-	-	-	2	2	2	3	2	-	-	-	-
CO4	-	-	-	-	-	2	1	2	1	1	-	-	-	-

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.

Head of Department
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Government College of Engineering, Karad				
First Year B. Tech. Electrical Engineering				
EE3111-Basic Electronics Engineering Lab				
Laboratory Scheme:			Examination Scheme:	
Practical	2 Hrs/Week		ISE	25
Total Credits	1		ESE	25

Course Outcomes (CO): After completion of course the Students will be able to

CO1	Understand characteristics of semiconductor devices.
CO2	Verify practical behaviour of diode and transistor circuits.
CO3	Analyse voltage regulator circuit.

Course Contents		CO
Experiment 1	Plot characteristics of various diodes.	CO1
Experiment 2	Plot characteristics of BJT.	CO1
Experiment 3	Identify terminals of diodes and transistors using multi-meter.	CO1
Experiment 4	Construct and verify half wave and full wave rectifier.	CO2
Experiment 5	Construct and verify voltage doubler circuit.	CO2
Experiment 6	To verify clipping and clamping circuit.	CO2
Experiment 7	To build and verify transistor amplifier circuit.	CO2
Experiment 8	To study the characteristics of MOSFET	CO1
Experiment 9	To study the characteristics of regulator circuit.	CO3

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	-	-	-	-	-	-	-	-	-	-	-	-
CO 2	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO 3	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO 4	3	2	-	-	-	-	-	-	-	-	-	-	-	-

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

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Government College of Engineering, Karad

First Year B. Tech Electrical Engineering

EE3201: Differential and Integral Calculus

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

Course Outcomes: After completion of the course the student will be able to

CO1	Solve ODEs and LDE with constant coefficient arising in Engineering domain using analytic approach.
CO2	Apply advance integral functions and technique.
CO3	Solve calculus of function of complex variables.
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, Kirchhoff's Law of Electrical circuits, Newton's Law of cooling.		CO1	(7)
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	(7)
Unit 3	**Differential and Integral Calculus:** Gamma function, Beta function and its properties, Differentiation under integral sign, Leibnitz rule.		CO2	(7)
Unit 4	**Functions of Complex Variable:** Differentiation: Calculus of functions of complex variable, Cauchy-Riemann equations, analytic functions, harmonic functions, finding harmonic conjugate; zeros of analytic functions, Integration: Cauchy's Theorem, Cauchy Integral formula (without proof), Cauchy Residue theorem(without proof)		CO3	(7)
Unit 5	**Surface Integral and Applications:** Evaluation of double integration in cartesian and polar coordinates, Change of order of integration, change of variable, Area enclosed by plane curves.		CO4	(7)
Unit 6	**Volume Integral and Applications:**		CO4	(7)

	Evaluation of Triple integration in Cartesian, spherical polar and cylindrical polar coordinates, volume of solids by triple integral.		
TutorialsFollowing is tentative list of tutorials to be conducted in the tutorial class based on 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. DUIS. 7. CR equations and Conjugate of functions. 8. Complex integrations. 9. Surface integrations and its applications. 10. Volume integrations and its applications.		(10)

Text Books

1.	H.K.Das, S. Chand and sons,Advanced Engineering Mathematics22nd edition, 2018.
2.	DebashisDatta Textbook of Engineering MathematicsNew Age International Publication,6th edition 2006.
3.	Ravish R..Singh, MukulBhatt.,Engineering Mathematics A Tutorial Approach, 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.	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

PLEASE NOTE: *Maximum 3-4 course outcomes are recommended to include in the curriculum. Use Bloom's taxonomy to define course outcomes. Refer AICTE new model curriculum for the same, if required.*

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Government College of Engineering, Karad					
First Year B.Tech Electrical Engineering					
EE3202: Engineering 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	02:30Hrs	

Course Outcomes:

After completion of course the 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	Hrs
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:**	CO2,	(07)

	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 science and engineering,Holography Techniques.	CO3, CO4	

Text Books				
1.	Avadhanulu and Kshirsagar- Engineering Physics ,S Chand publishing			
2.	V. Rajendran-Engineering Physics,Tata McGraw-Hill Publishing Company limited			
3.	Donald A. Neamen- Semiconductor Physics and Devices: Basic Principles- the McGraw-Hill Companies, Inc, Fourth Edition			

Reference Books				
1.	S. O. Pillai, Solid State Physics: Structure & Electron Related Properties, Eastern Ltd,, New Age International Ltd.			
2.	Charles Kittle, Introduction to Solid State Physics - Wiley India Pvt. Ltd.(8th Edition).			
3.	Alan Giambattista and others- Fundamentals of physics, Tata Mc. Graw Hills			
4.	B. L. Theraja -Modern Physics - S. Chand & Company Ltd., Delhi.			
5.	R. K. Gaur & Gupta S. L, Engineering Physics -DhanapatRai Publication.			
6.	Arthur Beiser-Modern Physics - Tata Mc. Graw Hills			
7.	K. Thyagarajan, A. K. Ghatak-LASERS Theory and Applications ; Macmillan India Limited.			
8.	L. J. Schiff-Quantum Mechanics ;Mc-Graw Hill International Edition.			
9.	N. Subramanyam&Brijlal-Text Book of Optics ; (Vikas Publishing House Pvt.Ltd)			

Useful Links				
1.	en.wikipedia.org/wiki/ Fundamentals of_Physics			
2.	www.hyperphysics.com, www.google.com			
3.	physics.info/magnetism, www.youtube.com, Nptl 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	-	-	1	1	-	-	-	-	1	-	-
CO 2	3	2	1	-	-	1	1	-	-	-	-	1	-	-
CO 3	3	2	1	-	-	1	1	-	-	-	-	1	-	-
CO 4	3	2	1	-	-	1	1	-	-	-	-	1	-	-

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

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Government College of Engineering, Karad					
(Sem – II) B. Tech. Electrical Engineering					
EX3203: Engineering Mechanics					
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	

Course Outcomes (CO): Students will be able to

1.	Understand basic concepts of mechanics
2.	Demonstrate knowledge of rotating coordinate systems
3.	Appreciate rigid body motion
4.	Demonstrate knowledge of kinematics and miketics

	Course Contents	CO	Hours
Unit 1	Transformation of scalars and vectors under Rotation transformation; Forces in Nature; Newton's laws and its completeness in describing particle motion; Form invariance of Newton's Second Law; Solving Newton's equations of motion in polar coordinates; Problems including constraints and friction; Extension to cylindrical and spherical coordinates.	CO1	(07)
Unit 2	Friction: Concept of friction, angle of friction, coefficient, angle of repose. Friction on horizontal plain and on inclined plain.	CO1	(07)
Unit 3	Non-inertial frames of reference; Rotating coordinate system: Five-term acceleration formula. Centripetal and Coriolis accelerations; Applications: Weather systems, Foucault pendulum;	CO2	(07)
Unit 4	Rigid body motion in two dimensions.Kinematics in a coordinate system rotating and translating in the plane; Angular momentum about a point of a rigid body in planar motion; Euler's laws of motion, their independence from Newton's laws, and their necessity in describing rigid body motion; Examples. Introduction to three-dimensional rigid body motion	CO3	(07)
Unit 5	Kinematics of rectilinear motion, motion curves, Newtons motion Law, Introduction to Projectile.	CO4	(09)
Unit 6	Kinetics: - De Alembert's principle, work-energy principle, Impulse - momentum principle,Collision of elastic bodies; direct central impact, oblique impact, coefficient of restitution,loss of kinetic energy.	CO4	(05)

Text Books					
1.	Engineering Mechanics, S. S. Bhavikatti,New Age International Pvt. Ltd				
2.	Engineering Mechanics,S. B. Junnerkar				
3.	Textbook of Applied Mechanics,Khurmi. R. S,Tata McGraw Hill Publishing Company, 5006				
4.	Engineering Mechanics (Statics and Dynamics),Palanichamy, M. S., and Nagan, S.				

Reference Books					
	Engineering Mechanics, Irving H. Shames, Prentice Hall of India, New Delhi				
	Engineering Mechanics, S. N. Saluja, SatyaPrakashan, New Delhi				
	Engineering Mechanics, Irving H. Shames, Prentice Hall of India, New Delhi				
	Power Plant Technology, M.M.ElWakil, Tata McGraw Hill. Int, 2nd Edition.Reprint, (2010				

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	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 2	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 3	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 4	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Assessment Pattern(with revised Bloom's Taxonomy)

Knowledge Level	MSE	ISE	ESE
Remember	10	10	25
Understand	05	05	20
Apply	05	05	15
Analyse	-	-	-
Evaluate	-	-	-
Create	-	-	-
TOTAL	20	20	60

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Government College of Engineering, Karad			
First Year (Sem.–I) B.Tech. Electrical Engineering			
EE3204: AC and DC Circuits			
Teaching Scheme		**Examination Scheme**	
Lectures	03Hrs/week	MSE	20
Tutorials	00Hrs/week		
Total Credits	03	ISE	20
		ESE	60
		Duration of ESE	02Hrs 30Min

Course Outcomes(CO)
Students will be able to

1.	Comprehend the basics of DC circuits.
2.	Solve the basic DC circuits and develop numerical solutions to fundamental electrical and electronics engineering problems.
3.	Apply network theorems for the analysis of electrical circuits

	CourseContents	Hours
Unit1	**DCCircuits**: Voltage and current sources, Dependent and Independent sources, source transformation Kirchhoff's laws, analysis of simple circuits with dc excitation. Heating effect of current. Star/delta transformation.	(8)
Unit2	**NetworkTheorems:** Node and Mesh Analysis, Superposition theorem, Thevenin theorem, Norton theorem, Maximum power transfer theorem, Reciprocity theorem, Compensation theorem.	(8)
Unit3	**AC Fundamentals:** Single phase alternating sinusoidal voltages and currents, effective and rms values. Rms value of non-sinusoidal voltages	(6)
Unit4	**Single phase circuits:** Single phase A.C. Series circuit with Resistance Inductance, Capacitance and phasor diagrams ,Series resonance. Parallel circuit with Resistance Inductance, capacitance and phasor diagrams, Parallel resonance. Impedance Triangle Active, Reactive and apparent power, power factor and power factor improvement by capacitor method, Polar & Rectangular Conversion	(8)
Unit5	**PolyphaseCircuits:** Three phase balanced AC supply: Three phase generation, Star and Delta balanced load, Relationship of phase and line values of voltage and current for Star and Delta connections. Power in three phase circuits.	(6)
Unit6	**Work Power Energy:** SI units of work Power and Energy. Conversion of energy from one form to another in electrical and thermal systems. Numericals on energy consumption.	(4)

	TextBooks			
1.	D.P.Kothari and I.J.Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.			
2.	C.K.Alexander and M.N.O.Sadiku, "Electric Circuits", McGraw Hill Education, 2004.			
Reference Books				
1.	E.Hughes, "Electrical and Electronics Technology", Pearson, 2010.			
2.	M.E.Van Valkenburg, "Network Analysis", Prentice Hall, 2006.			
Useful Links				
1.	https://nptel.ac.in/courses/117/106/117106034/			
2.	https://nptel.ac.in/courses/108108076/			
3.	https://nptel.ac.in/courses/108105062/			

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	-	-	-	3	2	-	-	-	-	1	-	-
CO 3	3	3	-	-	-	2	1	-	-	-	-	1	-	-
CO 4	3	2	-	-	-	2	2	-	-	-	-	1	-	-
CO 5	3	2	-	-	-	2	1	-	-	-	-	1	-	-

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

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

GovernmentCollegeofEngineering,Karad					
First Year (Sem–II)B.Tech.Information Technology					
EE3205: Indian Knowledge Systems					
TeachingScheme			ExaminationScheme		
Lectures	-		ISE		-
Tutorials	-		ESE		100
TotalCredits	02				
Course Outcomes (CO):Students will be able to					
CO1	Understand 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				

CourseContents

StudentshouldcompleteanyoneoftheMOOCcoursecertification of Indian Knowledge System andsubmitthecopyofcertificateto Head of Department prior to ESE.

Guidelines:

- DurationforcompletionofMOOCcoursecertification isminimum8Weeks.
- Platform:NPTEL or Swayam
- Assessment Guideline:- End semester evaluation will be based on the score secured in NPTEL or Swayam certification and Presentation conducted by Panel of Faculty members.
- 60% weightage will be given for score secured in NPTEL or Swayam certification and 40% weightage will be given for presentation.
- If students fail to complete the NPTEL or Swayam certification, student can complete it from other platforms with the prior permission of Head of department.

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Government College of Engineering, Karad					
First Year (Sem – II) B. Tech. Electrical Engineering					
EE EE2206: Computer Aided Design & Drafting Lab					
Teaching Scheme				Examination Scheme	
Lectures	--			ISE	50
Practical	02Hrs/week			ESE	--
Total Credits	01				

Prerequisite: Nil

Course Outcomes (CO):

1.	To impart computer-aided drawing skill in students
2.	Establishing relationship between traditional drafting technique and computer aided drafting.
3.	Understand the basic principles of Technical/Engineering Drawing to improve the visualization skills.
4.	The ability to demonstrates ideas and design concepts using drafting software.

(Except the basic essential concepts, most of the teaching part can happen concurrently in the laboratory)

	Course Contents	CO	Hours
Unit 1	*Overview of Computer Graphics covering,* listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CADD software [such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.	CO1, CO2, CO3	--
Unit 2	*Customisation & CADD Drawing* consisting of set up of the drawing page and the printer, including scale settings, Setting up of units and drawing limits; ISO and ANSI standards for coordinate dimensioning and tolerancing; **Orthographic constraints,** Snap to objects manually and automatically; Producing drawings by using various coordinate input entry methods to draw straight lines, Applying various ways of drawing circles, cones, cylinder, prisms, and pyramids.	CO1, CO2, CO3	--
Unit 3	*Annotations, layering & other functions covering* applying dimensions to objects, applying annotations to drawings; Setting up and use of Layers, layers to create drawings, Create, edit and use customized layers; Changing line lengths through modifying existing lines (extend/lengthen); Printing documents to paper using the print command;	CO2, CO3, CO4	--
Unit 4	**Orthographic projection techniques;** Drawing sectional views of composite right regular geometric solids and project the true shape of the sectioned surface; Drawing annotation	CO3, CO4	--
Unit 5	*Planar projection theory,* Including sketching of isometric, multi-view, section views. Dimensioning guidelines, tolerancing techniques; dimensioning and scale multi views of dwelling;	CO3, CO4	--
Unit 6	*Demonstration of a simple team design project* Geometry and topology of engineered components: creation of engineering models and their presentation in standard 2D blueprint form and as 3D wire-frame and shaded solids. Use of solid-modelling software for creating associative models at the component and assembly levels; floor plans that include: windows, doors, and fixtures such as WC, bath, sink, shower, *etc.*	CO4	--
	In semester Evaluation (ISE) shall be done on punctuality, interactive participation in class,		

laboratory work done and oral assessment

	Lab Contents	CO
Experiment No.01	Study of capabilities of software for Drafting and Modelling – Coordinate systems (absolute, relative, polar, etc.) – Creation of simple figures like polygon and general multi-line figures.	CO1, CO2, CO3
Experiment No.02	Drawing of a Title Block with necessary text and projection symbol	CO1, CO2, CO3, CO4
Experiment No.03	Drawing of curves like parabola, involute using B-spline or cubic spline.	CO1, CO2, CO3, CO4
Experiment No.04	Drawing of front view and top view of simple solids like prism, pyramid, cylinder, *etc.*, and dimensioning.	CO1, CO2, CO3, CO4
Experiment No.05	Drawing front view, top view and side view of objects from the given pictorial views (*e.g.* simple 3D Objects with hole and curves).	CO1, CO2, CO3, CO4
Experiment No.06	Drawing a single line diagram (any electrical system)	CO1, CO2, CO3, CO4
Experiment No.07	Drawing a basic house wiring diagram	CO1, CO2, CO3, CO4

Text Books	
1.	AutoCAD 2016 for Engineers & Designers, 22nd edition Vol 1 & 2; Prof. Sham Tickoo, Dreamtech Press

Reference Books	
1.	(Corresponding set of) CAD Software Theory and User Manuals

Mapping of COs and Pos:

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

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

ISE													

Government College of Engineering, Karad
First Year B. Tech. Electrical Engineering
EE 3207- EngineeringPhysics Lab

Laboratory Scheme:			Examination Scheme:	
Practical	2 Hrs/Week		**ISE**	25
Total Credits	1		**ESE**	25

Course Outcomes :

After the completion of the course, the students will be able to:

CO1	Verifylaws of electrostatic and magneto static experimentally.
CO2	Demonstrate abehavior 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 methodsfor engineering and technology.

Course Contents		CO
Experiment1	To study the volt-ampere characteristics of pn-junction and Zener diode, voltage regulator using Zener diode	CO1, CO3
Experiment2	To determine the velocityofultrasonic wavesinliquidmediumbyinterferometer.	CO2, CO4
Experiment3	Findanobject byUltrasonicwaves	CO2, CO4
Experiment4	To calculate the divergenceofLASERbeam.	CO2, CO4
Experiment5	DeterminationofwavelengthofLASERusingdiffractiongrating.	CO2, CO4
Experiment6	To study magneto resistance of n-type semiconductor	CO1, CO3
Experiment7	To study HalleffectinSemiconductor	CO1, CO3
Experiment8	To determine theenergygapinsemiconductor by four probe method	CO1, CO3
Experiment 9	TostudyFundamental ofSolar Energytrainer/WindenergyTrainer	CO2, CO4
Experiment10	To study fundamentals of fiber optics using fiber optics trainer	CO2, CO4
Experiment 11	To understand the reconstruction of hologram by Holography	CO2, CO4
Experiment12	To determine the magnetic susceptibility of the $FeCl_3$ solution.	CO1, CO3
Experiment13	To verify Faradays Law	CO1
Experiment14	To verify Lenz's law	CO1
	Demonstration Experiment	
Experiment15	TosynthesizeNanoparticlesbysprayPyrolysis/CVDmethod	CO4
Experiment16	TostudybehaviorofmaterialwithtemperaturebyTGA/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	-	-

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

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Government College of Engineering, Karad				
First Year B. Tech. Electrical Engineering				
EE 3207 - DC and AC Circuits Lab				
Laboratory Scheme:			Examination Scheme:	
Practical	2 Hrs/Week		ISE	25
Total Credits	1		ESE	25

Course Outcomes :

After the completion of the course, the students will be able to:

CO1	Apply network theorems to obtain the equivalent circuit.
CO2	Apply the knowledge of basic circuital law and simplify the network .
CO3	Analyze the circuit using Kirchhoff's law and Network simplification theorems
CO4	Obtain the maximum power transfer to the load , and Analyze the series resonant and parallel resonant circuit

Course Contents		CO
Experiment1	Observation of ac and dc voltage and current waveform on CRO	CO1
Experiment2	Verification of Kirchhoff's Voltage Law and Kirchhoff's Current law	CO3
Experiment3	R-L series circuit: Calculation of current, voltage and verification	CO2
Experiment4	R-C series circuit: Calculation of current and voltage and verification	CO2
Experiment5	R-L-C series circuit: Calculation of current and voltage and verification of series resonance	CO2
Experiment6	Verification of Superposition Theorem	CO1, CO3
Experiment7	Verification of Thevenin's Theorem	CO1, CO3
Experiment8	Verification of Maximum Power Transfer Theorem	CO1, CO3,CO4
Experiment 9	Verification of Nortan's Theorem	CO2, CO4
Experiment10	Verification of compensation Theorem	CO2, CO4
Experiment 11	Verification of line and phase quantities in balanced star connected load.	CO2
Experiment12	Verification of line and phase quantities in balanced delta connected load.	CO2

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	-	1	1	-	-
CO 2	3	3	2	-	-	1	1	-	1	-	1	1	-	-
CO 3	3	3	2	-	-	1	1	-	1	-	1	-	-	-
CO 4	3	3	1	-	-	1	1	-	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	Avg
Task I	15	15	15	15	15	15	15	15	15	15	
Task II	05	05	05	05	05	05	05	05	05	05	
Task III	05	05	05	05	05	05	05	05	05	05	
ISE											25

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Government College of Engineering, Karad				
First Year (Sem – II) B. Tech. Electrical Engineering				
EE3209: Experiential Learning Lab				
Teaching Scheme			Examination Scheme	
Practical	04Hrs/Week		ISE	50
Total Credits	02		ESE	--
			Duration of ESE	--
Prerequisite: Nil				
Course Outcomes (CO):				
Students will be able to				
CO1.	Appreciate functions of principals of various electrical equipment.			
CO2	Understand working of various home appliances			
CO3	Acquire skills of repairing of electrical appliances.			
CO4	Acquire capability of using various meters			
Lab No	Lab Assignments			CO
1	Work on various types of lamps, handle it , learn it and prepare report of understanding			CO1
2	Open electrical home appliance, understand its working, know its testing. Prepare report of understanding			CO1 &2
3	Open electrical home appliance, understand its working, know its testing. Prepare report of understanding			CO1 &2
4	Open electrical home appliance, understand its working, know its testing. Prepare report of understanding			CO1 &2
5	Handle various meters , Prepare report of understanding			CO3 &4
6	Open UPS, understand its working. Prepare report of understanding			CO3& 4
7	Work on various types of switches, handle it , learn it and prepare report of understanding			CO1
8	Understand electrical wiring of various departments and institute and write report			CO4

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	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 3	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 4	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Assessment Pattern: (with revised Bloom's Taxonomy)

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Government College of Engineering, Karad				
First Year (Sem – II) B. Tech. Electrical Engineering				
EE3210: National Cadet Corps				
Teaching Scheme			**Examination Scheme**	
Lectures	04Hrs/Week		MSE	
Tutorials	-		ISE	50
Total Credits	1		ESE	
			Duration of ESE	

Prerequisite: Nil

Course Outcomes (CO): Students will be able to

1.	Develop sense of discipline, character, and brotherhood, the spirit of adventure and ideals of selfless service.
2.	Understand grace and dignity in the performance of foot drill.
3.	Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.
4.	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 :-		

		1.	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.
		2.	B. In all other cases, where above conditions are not fulfilled, the cadet must attend 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
CO1						2		2	1			1			1
CO2									2			1			
CO3								1	1						
CO4									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.

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Government College of Engineering, Karad				
First Year (Sem – II) B. Tech. Electrical Engineering				
EE3210: 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

1.	Understand thecommunityinwhichtheyworkandtherelation
2.	Identifytheneedsandproblemsofthecommunityandinvolvetheminproblem-solving
3.	Developcapacitytomeetemergenciesandnaturaldisasters
4.	Practicenationalintegrationandsocialharmony.
5.	Utilizetheirknowledgeinfindingpracticalsolutionstoindividualandcommunityproblems.

Course Contents	CO	Hrs
NationalServiceScheme: 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, VysanMukti 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,　8 Hrs. regulation, social issues. 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 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.	NationalServiceSchemeManual,GovernmentofIndia.			
2.	TrainingProgrammeonNationalProgrammescheme,TISS.			
3.	OrientationCoursesforN.S.S.Programmeofficers,TISS.			
4.	CasematerialasTrainingAidforfieldworkers,*GurmeetHans.*			
5.	SocialserviceopportunitiesinHospitals,*KapilK.Krishan,*TISS.			
6.	SocialProblemsinIndia,*RamAhuja.*			
7.	National Service Scheme Manual (Revised), 2006 Government of India, Ministry of Youth Affairs and Sports, New Delhi.			
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.	RashtriyaSevaYojanaSankalpana - Prof. Dr.SankeyChakane, 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	PurushottamSheth, 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_llESHogw-coZo7PQdYliF-msj			
3.	https://www.youtube.com/watch?v=paJK5X6zqI8&list=PLp4YWOW_llESHogw-coZo7PQdYliF-msj&index=1			

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Mapping of COs and POs

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	1	1	-	-	-	1	1	1	1	-	-	-	1	1	1
CO 2	1	1	-	-	-	1	1	1	1	-	-	-	1	1	1
CO 3	1	1	-	-	-	1	1	1	1	-	-	-	1	1	1
CO 4	1	1	-	-	-	1	1	1	1	-	-	-	1	1	1
CO5	1	1				1	1	1	1				1	1	1

Assessment Pattern: (with revised Bloom's Taxonomy)

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

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Government College of Engineering, Karad				
First Year (Sem – II) B. Tech. Electrical Engineering				
EE3210: 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

1.	Understand various schemes supporting entrepreneurship.
2.	Use various entrepreneurship models.
3.	Identify qualities of entrepreneurs.
4.	Utilize their knowledge in finding practical solutions to individual and community problems.

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. Kickstarting 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 consist 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.	VenkateshwaraRao and UdaiPareek,(Eds)Developing Entrepreneurship-A Handbook.
7.	Ravi J. Mathai, Rural Entrepreneurship A Frame Work in Development Entrepreneurship –Ahandbook.

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	-	-	20
Understand	-	-	10
Apply	-	-	10
Analyse	-	-	10
Evaluate	-	-	-
Create	-	-	-
Total	-	-	50

Government College of Engineering, Karad				
First Year (Sem – II) B. Tech. Electronics and Telecommunication Engineering				
EE3210: Community Service and Practices (CSP)				
Teaching Scheme			**Examination Scheme**	
Lectures	00Hrs/Week		ISE	50
Practical	02Hrs/Week		ESE	-
Total Credits	01		Duration of ESE	-

Course Outcomes (CO):After successful completion of course the Students will be able to	
CO1	Understandthecommunity needsinwhichthey are living.
CO2	Identifytheproblemsofthecommunityand help to solve them.
CO3	Apply technical knowledge of respective field to train local community.
CO4	Practicenationalintegrationandsocialharmony.

	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 thateffect.		
	MODULE I: The institute has signed MoU with NASSCOM for implementation of digital literacyprogram (under NDLM - National Digital Literacy Mission). The program shall covertraining of school children or village youths on one of the 7 modules designed byNASSCOM such as internet, mobile banking, e-commerce, e-business, use of media likeWhatsApp/ linkedin etc. The course details are provided by NASSCOM. The course work ofeach module consists of presentation of readymade power point slides as a theory andseparate practice sessions. The module shall be followed by test and joint certification ofsuccessful candidates (institute and NASSCOM). The theory sessions shall be conducted inthe respective schools and the practical may be conducted in schools subject to availabilityof computational facility OR in the computer centre of our institute on weekend. The totalduration of the course shall be between 40 to 60 hours. The students shall visit schools covering 20 km surrounding area (ruraland municipal schools) and register the school students. The target for each student shall bedelivery and certification of one of the modules to a group of 6 school students. Travellingallowance for travel by bus (bus ticket) or sleeper class shall only be admissible to thestudents 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 60hours of activities for technology transfer to community within 20 km. The activities shallbe declared by respective Head of the department. The list of different CSP activities to beconducted under this module shall be but not limited to the following. The activity has to beconducted under the institute banner and counting of its equivalent duration shall be asIndicated against each. He/she should collect total 60 Hours from CSP activities. 1. Two wheeler maintenance 16 Hrs.	CO1, CO2, CO3, CO4	60

	2. Motor cycle repairing 16 Hrs.		
	3. Electrical wiring 16 Hrs.		
	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,GovernmentofIndia.
2.	TrainingProgrammeonNationalProgrammescheme,TISS.
3.	CasematerialasTrainingAidforfieldworkers,*GurmeetHans.*
4.	SocialserviceopportunitiesinHospitals,*KapilK.Krishan*,TISS.
5.	SocialProblemsinIndia,*RamAhuja.*
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.	RashtriyaSevaYojanaSankalpana - Prof. Dr.SankeyChakane, 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	PurushottamSheth, 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_llESHogw-coZo7PQdYliF-msj
3.	https://www.youtube.com/watch?v=paJK5X6zqI8&list=PLp4YWOW_llESHogw-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	PSO3
CO 1		1	-	-	-		1	1		1	-	-	1	1	1
CO 2	1	1	-	-	-	1	1	1	1	1	-	-	1	1	1
CO 3	1	1	-	-	-	2	1	1	1	1	-	-	1	1	1
CO 4	1	1	-	-	-	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	-	-	10
Understand	-	-	10
Apply	-	-	20
Analyse	-	-	10
Evaluate	-	-	-
Create	-	-	-
Total	-	-	50

Head of Department
Electrical Engineering Department
Goverment College of Engineering, Karad.

Government College of Engineering, Karad					
First Year (Sem – II) B. Tech. Electrical Engineering					
EE3211 : Programming Language C++					
Laboratory Scheme:				Examination Scheme:	
Practical	02 Hrs/week			ISE	25
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:					
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	-	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	
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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