Government College of Engineering, Karad

First Year (Sem – I) B. Tech. Electronics and Telecommunication Engineering

EX3101-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

CO1	Understand fundamental of Chemistry relevant to Engineering field.
CO2	Understand construction working and mechanism of battery.
CO3	Equipped with basic knowledge of polymer reinforced composites, applications of semiconductor conducting polymers in energy harnessing.
CO4	Acquire Basic knowledge of Nano chemistry 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 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.	CO1 CO3	(07)
Unit 4	**Environmental & Green Chemistry:** Introduction, definition, Major environmental pollutants, Air, water and noise	CO1 CO5	(07)

	pollution. Optimum levels of pollution. Significance and determination of COD and BOD. Solid waste treatment of collection of NKP. Greenhouse effect and global Warming. e-waste. Radioactive pollution. Basic principles of green chemistry. Various green chemical approaches – Microwave synthesis, Bio catalysed 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	CO1 CO5	(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 graphene – 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, Sivakumar & Pushpa Iyengar.,- “Chemistry for Engineering Students”, Subash Publications, Bangalore. 10th Edition, 2020.
5.	"Modern Electrochemistry 2A: Fundamentals of Electronics" by J O'M Bockeris and M G-Aldeco
6.	Handbook of Carbon Nanotubes Jiji Abraham, Sabu Thomas, Nandakumar 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	PSO3
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

Government College of Engineering, Karad

First Year (Sem – I) B. Tech. Electronics and Telecommunication Engineering

EX3102-Matrix Algebra and 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

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	Separate real and imaginary parts of Hyperbolic functions and logarithms of complex number.
CO3	Deal with functions of several variables and their applications.
CO4	Apply integral techniques and 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.	CO1	**(7)**
Unit 3	**Complex Numbers:** Euler's theorem, Hyperbolic and Inverse Hyperbolic functions, logarithms of complex number, Separation into real and imaginary parts.	CO2	**(7)**
Unit 4	**Partial Differentiation*:*** Partial derivatives, Homogeneous functions and Euler's theorem, Composite function, total derivative, Maxima/Minima of functions of two variables.	CO3	**(7)**
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	**(7)**
Unit 6	**Differential and Integral Calculus:** Gamma function, Beta function and its properties, Differentiation under integral sign, Leibnitz rule.	CO4	**(7)**
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. Separation into real and imaginary part of hyperbolic and logarithmic function. 6. Direct differentiation and Euler's theorem. 7.Composite function and total derivative. 8.Maxima/Minima of functions of two variables. 9.Directional Derivatives, Curl and Divergence of vector point function. 10. Beta, Gamma functions and DUIS.			**(10)**

Text Books

1.	H. K. Das, S. Chand and sons, Advanced Engineering Mathematics22nd edition, 2018.
2.	Debashish Datta Textbook of Engineering Mathematics New Age International Publication,6th edition 2006.

3.	Ravish R. . Singh, Mukul Bhatt., 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.Manish Goyal, Textbook of Engineering Mathematics Laxmi publication 12th edition 2020.
Useful Links	
1.	http://www.nptel.iitm.ac.in
2.	www.ocw.mit.edu

Mapping of COs and POs

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

Government College of Engineering, Karad

First Year (Sem – I) B. Tech. Electronics and Telecommunication Engineering

EX3103: Basic Electrical and 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	02:30 Hrs

Prerequisite: Electrostatics

Course Outcomes: Student will be able to

1.	Explain the basic laws and circuits in electrical
2.	Apply the basic circuits, laws to analyze ac and dc circuits.
3.	Elaborate working principle of electrical machines and to know the applications.
4.	Become familiar with analysis of and range of applications for diodes, BJT.
5.	Define role of communication system in the field of engineering.

	Course Contents	CO	Hrs
Unit 1	**DC Circuits:** Ohm's law and Kirchoff's laws, Types of sources , dependent and independent sources, source transformation, voltage division and current division, Mesh and Nodal analysis, star-delta transformation	CO1 CO2	(06)
Unit 2	**AC Circuits** : Representation of Sinusoidal waveform,Phasorrepresentation,averagevalue,RMSvalue,formfactor,peak factor of sinusoidal voltage and currents, Analysis of ac circuits with R,L,C & RL,RC,RLC circuits with phasor diagrams. Real power ,reactive power, apparent power and power factor. **simple numerical.**	CO1 CO2	(08)
Unit 3	**Three Phase A.C Circuits:** Necessity and Advantages of three phase systems, definition of Phase sequence, balanced supply and balanced load; Relationship between line and phase values of balanced star and delta connections.	CO1 CO2	(06)
Unit 4	**DC & AC MACHINES :** **DC Machine :-** Principle of operation, constructional details, Working , characteristics ,induced emf ,the relation between induced emf and terminal voltage , types and applications. **Induction machine :-** Single phase induction motor : construction, working, double field revolving theory ,types and applications.	CO3	(08)
Unit 5	**Diode & Transistor:** Semiconductor diode: Operation, Bias conditions, Characteristics of diode, Half wave & full wave rectification ,Operation of Clippers ,Clampers ,Zener diode , practical applications. **Bipolar Junction Transistor** : Transistor operation, configurations, DC biasing of transistor, **Introduction** to FET & Operational amplifiers.	CO4	(08)
Unit 6	**Introduction to communication systems:** Communications, communication system-Information, Transmitter, channel& noise , receiver, need for modulation, bandwidth, requirements, Introduction to	CO5	(06)

	generations in Telecommunication(1G,2G,3G,4G &5G)		

Text Books	
1.	"A Textbook of Electrical Technology", B.L.Thareja , A. K. Thareja ,S. Chand.
2.	"An Integrated Course in Electrical Engineering. B. Gupta,S. K. Kataria &Sons.
3.	"Electronic Devices & Circuit Theory"Robert Boylestad, Louis Nashelsky,11th edition,pearson.
4.	"Electronic communication systems", Kennedy, Davis,Tata Mcgraw Hill.
5.	"Electric Machines", Nagrath and Kothari, Tata McGraw-Hill.
Reference Books	
1.	Basic Electrical Engineering Third Edition, Ravish Singh, Mc Graw Hill education.
2.	Dr. Murugesh Kumar.K ."DC Machines and Transformers", Vikas Publishing House Pvt Ltd.
3.	"Electric Machines" ,Ashfaq Husain and Haroon Ashfaq, Dhanpat Rai & Co.
Useful Links	
1.	https://nptel.ac.in/courses/108108076
2.	http://www.schandpublishing.com

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

Assessment Pattern: (with revised Bloom's Taxonomy)

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

Government College of Engineering, Karad				
First Year (Sem – I) B. Tech. Electronics and Telecommunication Engineering				
EX3104: Engineering Graphics				
Teaching Scheme			Examination Scheme	
Lectures	02 Hrs/Week		MSE	--
Tutorials	00 Hrs/Week		ISE	50
Total Credits	02		ESE	--
			Duration of ESE	--

Prerequisite: Nil

Course Outcomes (CO): Students will be able to

1.	Understand theory of projections and apply it for communication shape and size of geometric element using appropriate projection method
2.	Draw different engineering curves using various methods, and know the application in engineering filed
3.	Analyse visually and draw projection of points, straight lines, planes, solids
4.	Appreciate use of Orthographic & isometric drawing, sections of solids, and development of surfaces

	Course Contents	CO	Hrs
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. Engineering Curves: Construction of regular polygons, Conic sections; Construction of Ellipse –(Focus- Directrix method, Rectangle method, four center method), Parabola - (Focus- Directrix method, Rectangle Method), hyperbola – (Focus-Dyrectrix method); Cycloidal curves, (excluding Epicycloid, Hypocycloid, and Involutes, Methods to draw tangent and normal for above engineering curves. Applications of curves in engineering.	CO1, CO2	(07)
Unit 2	Theory of Orthographic Projections: Principles & theory of Orthographic 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 *w.r.t.* HP & VP planes.	CO1, CO3	(05)
Unit 4	Projections of Regular Solids: Types of Solids, Projection of simple solids; Prisms, Pyramids, and cylinder, cone inclined to both reference planes.	CO1, CO3, CO4	(06)
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, CO4	(03)
Unit 6	Isometric Projections: Principles of Isometric projection – Terminology, Isometric Scale, Isometric Views of standard shapes & standard solids.	CO4	(04)

In semester Evaluation (ISE) shall be done on punctuality, interactive participation in class, laboratory work done and oral assessment		
Text Books		
1.	Bhatt N.D., Engineering Drawing: Plane & Solid Geometry, 54th edition, 2023, Charotar Publishing House	
2.	Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education	
3.	Basant Agrawal, C M Agrawal, Engineering Graphics, 3rd edition (2019)TMH Publication	
4.	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, 7th ed, 2015 TMH Pub	
2.	M. L. Dabhade, Engineering Graphics, Vision Publication	
3.	Kristie Plantenberg, Engineering Graphics Essentials, 5th ed, 2015 University of Detroit Mercy, SDC Publication	
Useful Links		
1.	https://nptel.ac.in/courses/112103019/	
2.	https://archive.nptel.ac.in/courses/112/102/112102304/	
3.	https://archive.nptel.ac.in/courses/112/105/112105294/	

Mapping of COs and POs

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

Assessment Pattern: (with revised Bloom's Taxonomy)

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

Government College of Engineering, Karad

First Year (Sem – I) B. Tech. Electronics and Telecommunication Engineering.

EX 3105: Design Thinking

Teaching Scheme			**Examination Scheme**	
Lectures	02 Hrs/Week		**MSE**	--
Practical	00 Hrs/Week		**ISE**	50
Total Credits	02		**ESE**	--
			Duration of ESE	---

Prerequisite:

Course Outcomes (CO):

Students will be able to

1.	Apply the principles and significance of design thinking in problem-solving and innovation.
2.	Comprehend the importance of prototyping in engineering design, and be familiar with various types of prototyping techniques.
3.	Acquire knowledge of quality aspects in design.
4.	Develop an entrepreneurial mindset that embraces uncertainty, takes calculated risks, and adapts to changing market conditions.
5.	Describe the concept and need for obtaining IPR and patent.

	Course Contents	**CO**	**Hrs**
Unit 1	**Introduction to Design Thinking:** Introduction to design thinking; Need of Design in Engineering; The 7 Steps of the Engineering Design thinking Process- Define, Ask, Imagine, Plan, Prototype, Test, Improve.	CO1	(04)
Unit 2	**Processes in Design Thinking:** Stages of Design Thinking - Empathize, Define, Ideate, Prototype, Test;	CO2	(04)
Unit 3	**Prototyping:** Need for Prototype in Engineering Design; Types of Prototyping- Rapid (Throwaway) prototyping, Evolutionary prototyping, Incremental prototyping, Extreme prototyping, Steps in prototyping.	CO2	(05)
Unit 4	**Quality Aspects in Design**: Covering quality, reliability, safety, Development, assembly, maintenance, logistics, handling, disassembly, recycling, re-engineering.	CO2	(05)
Unit 5	**Entrepreneurial Mindset:** Mental attitude or inclination toward entrepreneurship, what does it mean to be entrepreneur? Learn to discover, evaluate and exploit opportunities, creation of value, embracing uncertainty, putting it all together.	CO3	(05)
Unit 6	**Intellectual Property rights:** Introduction to IPRs, Basic concepts and need for Intellectual Property - Patents, Copyrights, Geographical Indications, Nature of Intellectual Property, Industrial Property, technological Research, Inventions and Innovations – Important examples of IPR.	CO4	(05)
	Total Lectures		**28**

Text Books

1.	Balmer, R. T., Keat, W. D., Wise, G., and Kosky, P. (2020). Exploring Engineering: An Introduction to Engineering and Design, Academic Press, 3rd edition, pp.149-198
2.	Dym, C. L., Little, P. and Orwin, E. J. (2019). Engineering Design - A Project-based Introduction, Wiley Publication, 4th edition, pp.238-280.

Reference Books

1.	George, E, Dieter, Linda, C, Schmidt. (2017). Engineering Design, McGraw Hill publisher, 4th edition, pp.67-93.
2.	Kathryn, Christopher. (2019). Design Thinking in Engineering, Kendall/Hunt Publishing Co, 1st edition, pp.156-249.

3.	C. Meinel, L. Leifer, Design Thinking: Understand-Improve- Apply, Springer.
E Books	
1.	**https://www.rcsc.gov.bt/wp-content/uploads/2017/07/dt-guide-book-master-copy.pdf**
Useful Links	
1.	**https://nptel.ac.in/courses/110106124**
2.	**https://archive.nptel.ac.in/courses/110/106/110106124/**
3.	https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process
4.	https://www.interaction-design.org/literature/article/design-thinking-get-started-with-prototyping
5.	https://asq.org/blog/2017/09/design-thinking-and-quality/

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO7	PO8	PO 9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	2	2	1	-	-	-	-	-	-	1	1	1	1	1
CO2	2	1	1	-	-	-	-	-	-	-	-	-	1	1	1
CO 3	1	1	-	1	-	1	1	-	-	-	-	-	-	-	1
CO 4	3	2	2	3	2	1	1	1	1	1	3	1	2	2	2
CO5	1	2	1	1	-	-	-	-	-	-	-	1	1	-	-

Assessment Pattern: (with revised Bloom's Taxonomy)

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

Government College of Engineering, Karad				
First Year B. Tech. Electronics and Telecommunication Engineering				
EX3106-Engineering Chemistry Laboratory				
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	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 the percentage of zinc from brass	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	-	-
CO 5	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											

Government College of Engineering, Karad				
First Year (Sem – I) B. Tech. Electronics & Telecommunication Engineering				
EX3107: Engineering Graphics Laboratory				
Laboratory Scheme:			**Examination Scheme:**	
Practical	2 Hrs./Week		**ISE**	--
Total Credits	1		**ESE**	50

Prerequisite : Nil

Course Outcomes (CO): Students will be able to

1.	Acquire skills sets to use engineering drawing instruments, symbols, conventions, title block in engineering drawing, to communicate his ideas, information and instructions.
2.	Dimension and annotate two-dimension & three-dimensional engineering drawings
3.	Plan and prepare neat engineering drawing of various engineering curves, orthographic drawings of points, straight lines, planes, solids, and section of solids, isometric views, development of surfaces
4.	Develop a skill of visualization to understand and read the engineering drawing

Course 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

ESE will be based on Oral examination on submission work of Drawing sheets, Quiz etc

List of Submission:

1.	Minimum number of Experiments: 6

Mapping of COs and Pos:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2			3			1		2		1	1	1	1
CO2	2	2			2			2		3		2	1	1	1
CO3	3	3			3			2		3		2	1	1	1
CO4	2	2			2			2		3		2	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	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	
ISE	25	25	25	25	25	25	25	

Government College of Engineering, Karad

First Year (Sem – I) B. Tech. Electronics and Telecommunication Engineering

EX3108: Programming for problem solving Laboratory

Laboratory Scheme:			**Examination Scheme:**	
Lectures	1 Hrs/Week		**ISE**	50
Practical	2 Hrs/Week		**ESE**	25
Total Credits	2			

Prerequisite :

Course Outcomes (CO):

Students will be able to

1.	Apply programming skills to constructs loops, conditional statements, and branching.
2.	Utilize functions to modularize code and improve code reusability.
3.	Write and execute C programs to solve simple to complex problems.
4.	Implement file operations for input/output handling in C programs.

Course Contents		**Hrs.**
Unit 1	**INTRODUCTION TO C PROGRAMMING** Introduction to Computing: Introduction, Art of Programming through Algorithms and Flowcharts Overview of C: History and importance of C, Basic structure of C program, executing a C program. Constants, Variable and Data Types: Introduction, Character Set, C Tokens, Keywords and Identifiers, Constants, Variables, Data Types, Declaration of Variables.	2
Unit 2	**OPERATORS AND EXPRESSIONS** Introduction, Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operator, Bitwise Operators,	1
Unit 3	**CONTROL STRUCTURES** Decision Making and Branching: Introduction, Decision Making with IF Statement, Simple IF Statement, the IF-ELSE Statement, Nesting of IF-ELSE Statements, The ELSE IF Ladder, The Switch statement, The Operator, The go to statement. Decision Making and Looping: Introduction, the while Statement, the do statement, the For statement, Jumps in LOOPS.	3
Unit 4	**INTRODUCTION TO ARRAYS AND STRINGS Arrays**: One-dimensional Arrays, Declaration of One-dimensional Arrays, Initialization of One-dimensional Arrays, Example programs- Bubble sort, Linear search, Two-dimensional Arrays, Declaration of Two-dimensional Arrays, Initialization of Two-dimensional Arrays.	3
Unit 5	**FUNCTIONS AND INTRODUCTION TO POINTERS** User-defined Functions: Need for functions, Elements of User-defined Functions, Definition of Functions, Return Values and their Types, Function Calls, Function Declaration, Category of Functions, No Arguments and no Return Values, Arguments but no Return values, Arguments with Return Values, No Arguments but Returns a Value, Passing Arrays to Functions, Recursion, The Scope, Visibility and Lifetime of variables.	3
Unit 6	**STRUCTURES AND FILE MANAGEMENT** Structures: Introduction, defining a structure, declaring structure variables, accessing structure members, structure initialization, array of structures. File Management in C: Introduction, Defining and opening a file, closing a file, Input/output and Error Handling on Files.	2

Experiment 1	**Simple C Program Print Your Name and address**	CO1
Experiment 2	**Use of Variable in Expression** To write a C program to use the variables in expressions and their evaluation.	CO1
Experiment 3	**Swap Two Variables** To write a C program to swap values between two variables using a third variable. To write a C program to swap values between two variables without using third variable.	CO2
Experiment 4	**Largest of Three Numbers** To write a C program to find the largest number between given three numbers.	CO2
Experiment 5	**Program to Count, Sum and Reverse the Given Number** To write a C program to read an integer number, find the number of digits and sum of all individual digits and also print the above number in reverse order.	CO2, CO3
Experiment 6	**Arrays within Structures** To write a C program to prepare the total marks for N students by reading Register No., name and Six Marks by using array within structures.	CO3
Experiment 7	**Calculate Subject wise, Student wise Total and Store them as Part of Structure.** To write a C program to calculate subject wise and student wise totals and store them as part of a structure.	CO2 CO4
Experiment 8	**Sort an Array of Integers.** To write a C program to sort an array of integers by using a function call	CO2, CO3
Experiment 9	**Locate and Display the Contents of an Array using Pointers** To write a C program to locate and display the contents of an array using pointers.	CO3 CO4
Experiment 10	Write a program to convert temperature from Celsius to Fahrenheit and vice versa.	CO3 CO4
List of Submission:		
1.	Minimum number of Experiments: 10	

Mapping of COs and Pos:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	2	2	-	-	2	-	-	-	-	-	-	-	1	1	1
CO2	2	2	-	-	2	-	-	-	-	-	-	-	1	1	1
CO3	2	1	-	-	2	-	-	-	-	-	-	-	1	1	1
CO4	-	1	-	-	2	-	-	-	-	-	-	-	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	25	25	25	25	25	25	25	25	25	

Government College of Engineering, Karad

First Year (Sem – I) B. Tech. Electronics and Telecommunication Engineering

EX3109 : Professional Communication Skills

Laboratory Scheme			Examination Scheme	
Lecture	1Hrs/week		ISE	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**- Reading Readers Digest/India Today/Autocar/EFY. Write down the same to Summaries. Strategies for Creating & Editing Effective Writing=Blog Writing (specific/suggest topics/give topics)	CO1
Experiment 6	**Watching Ted Talk and summarize it.** Strategies for Creating & Editing Effective Writing -Story writing and Narration	CO3
Experiment 7	**Develop a Welcome speech** on the given Theme/situation /Formulate a speech for introducing a guest in the given situation. **Group Discussion**- Group Discussion Rules	CO3
Experiment 8	**Just a Minute (JAM) -**Prepare for 1 min on spontaneous topic and deliver public talk on same. Solving MNC (Company 1) Verbal Ability questions	CO4
Experiment 9	**Debate:** International Topic and summarize the opinion as a Country. Strategies for Creating & Editing Effective Writing -Email Writing Activity2	CO4
Experiment 10	**Writing effective resumes and Cover Letters** Mock Interviews (Personal HR)	CO3

Text Books

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

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

Mapping of COs and Pos

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 6	PO 8	PO 9	PO 10	PO 11	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	ISE	ESE
Remember	10	05
Understand	15	05
Apply	15	10
Analyze	10	05
Evaluate	-	-
Create	-	-
TOTAL	50	25

Government College of Engineering, Karad

First Year (Sem – I) B. Tech. Electronics and Telecommunication Engineering

EX3110: Electronics Workshop and PCB Laboratory

Laboratory Scheme			**Examination Scheme:**	
Practical	2 Hrs./Week		**ISE**	100
Total Credits	1		**ESE**	-

Prerequisite :NIL

Course Outcomes (CO):

Students will be able to

1.	Identify and test different types of components, understand their properties and safety guidelines.
2.	Explain the working and relationships between components, comprehend the importance of proper circuit connections.
3.	Apply the knowledge of electrical and electronics components to design and construct simple circuits
4.	Analyze circuit diagrams and compare circuit implementation methods.

Course Contents		**CO**
Experiment 1	Identification and information related to different types of Electrical and Electronics components. a) Resistor, Capacitor, Inductor, Transformer b) Diode, Transistor, LED	CO1
Experiment 2	Study of lab equipment: CRO, Function generator, Power supply, Multimeter, Breadboard.	CO1
Experiment 3	Testing of component using Multimeter& LCR-Q meter (Resistor, Capacitor, Diode, transistor LED etc.)	CO1
Experiment 4	Information& applications of wires, cables, connector, fuses, switches, relays, display, cutter, wire stripper etc.	CO2
Experiment 5	Implement and test the simple circuit on breadboard with safety precaution. (Simple RL, RC, RLC, Rectifiers, clipper & clamper, BJT amplifier)	CO3
Experiment 6	Printed Circuit Board (PCB) lab: Installation and basic information of Proteus software.	CO1
Experiment 7	Draw the simple circuit and their layout using Proteus software. (Simple RL, RC, RLC, Rectifiers, clipper & clamper, BJT amplifier)	CO4
Experiment 8	Comparative analysis of circuit implemented using breadboard and Proteus software(simulation). (Simple RL, RC, RLC, Rectifiers, clipper & clamper, BJT amplifier)	CO2, CO4
Experiment 9	Perform drilling, masking, etching, soldering, desoldering etc operations to prepare Printed Circuit Board (PCB)	CO3
Experiment 10	Design and fabrication of single sided Printed Circuit Board (PCB) for a simple circuit with manual etching (Ferric chloride) and drilling.	CO3, CO4
Experiment 11	Mini project: Design the regulated power supply to generate 5V& 12V supply.	CO3, CO4

List of Submission:

1.	Minimum number of Experiments: 10 (provided mini project is mandatory)

Mapping of COs and Pos:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	1	-	-	2	-	-	-	-	-	1	2	2	1
CO2	2	2	1	-	2	1	-	-	-	-	-	-	1	1	1
CO3	2	2	1	1	2	1	1	-	-	-	-	-	1	1	1
CO4	2	2	2	1	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	
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	25	25	25	25	25	25	25	25	25	

Government College of Engineering, Karad

First Year (Sem – I) B. Tech. Electronics and Telecommunication Engineering

EX3111: 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).Samagra Yoga Chikitse. Bengaluru: Swami Vivekananda Yoga Prakasana.
2.	Kumar, Ajith. (1984) Yoga Pravesha. Bengaluru: Rashtrothanna Prakashana.
3.	D.M Jyoti, Yoga and Physical Activities (2015) lulu.com3101, Hillsborough, NC27609, United States.
4.	Uppal, A. K. (1992). Physical Fitness. New Delhi: Friends Publication.

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.

Government College of Engineering, Karad				
First Year (Sem – II) B. Tech. Electronics and Telecommunication Engineering				
EX3201: 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	02:30 Hrs

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,	CO2, CO3, CO4	(07)

	chain Reaction, Nuclear Reactor, P-P and C-N Reactions (Thermonuclear Reaction), Examples.		
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 science and engineering, Holography Techniques.	CO2, CO3, CO4	(07)

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 -Dhanapat Rai 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

Government College of Engineering, Karad

First Year (Sem – II) B. Tech. Electronics and Telecommunication Engineering

EX3202-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

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 vector integral functions and techniques.
CO3	Trace Cartesian and Polar curves.
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	**(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	**Tracing of Curves:** Tracing of curves in Cartesian and polar form, Asymptotes in Cartesian form, Oblique asymptote.	CO2	**(7)**
Unit 4	**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.	CO3	**(7)**
Unit 5	**Volume Integral and Applications:** Evaluation of Triple integration in Cartesian, spherical polar and cylindrical polar coordinates, Volume of solid by triple integral.	CO4	**(7)**
Unit 6	**Vector Integration:** Line integral, Surface integral, green's theorem in the plane, Stokes's theorem, Volume integral, Gauss Divergence theorem.	CO4	**(7)**
Tutorials Following 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. Curve tracing of Cartesian curves. 6. Curve tracing of Polar curves. 7. Surface integrations and its applications. 8. Volume integrations and its applications. 9. Line integral, surface integral of vector function. 10 different theorems on vector integrations.			**(10)**

Text Books

1.	H.K.DAS "Advance Engineering Mathematics" S. Chand publications
2.	Debashish Datta "Textbook of Engineering Mathematics'' New Age International Publication.
3.	Ravish R..Singh, Mukul Bhatt. "Engineering Mathematics A Tutorial Approach". Tata, McGraw Hill.

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., McGraw-Hill, 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

Government College of Engineering, Karad				
First Year (Sem – II) B. Tech. Electronics and Telecommunication 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.	Solve problems on equilibrium of rigid bodies, friction
3.	Understand trusses, joints, section.
4.	Understand centroid and moment of inertia, kinematic and laws of motion with problem.

	Course Contents	CO	Hours
Unit 1	Basic concepts and fundamental laws, force, systemof forces, resolution and composition of force, resultant, Principal of transmissibility of force, Moment and couple, Varignon's theorem and law of moment, Equilibrium, Freebody diagram, Lami's theorem, equilibrium equations, equilibrant force.	**CO1**	**(07)**
Unit 2	Beam: Definition and types of beams, types of loads, types of supports, analysis of simple by analytical method and virtualwork method to calculate supportreactions. Friction: Concept of friction, angle of friction, conefriction, angleof repose. Friction on horizontal plain and on inclined plain.	**CO1**	**(07)**
Unit 3	Analysis of Struss: Types of trusses, Assumption, Method of Joints, Method of section, Analysis of simple truss with max. 7members.Introduction to space truss.	**CO2**	**(07)**
Unit 4	Centroid of plane and composite figures, parallel and perpendicular axis theorems, moment of inertia of standard shapes from first principle, moment of inertia of composite figures, radius of gyration, Concept of mass moment of inertia.	**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, Satya Prakashan, New Delhi
	Engineering Mechanics, Irving H. Shames, Prentice Hall of India, New Delhi
	Power Plant Technology, M. M. El Wakil, Tata Mc Graw Hill. Int, 2nd Edition. Reprint, (2010

Mapping of COs and POs

PO →	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 ↓														
CO 1	2	2	-	2	2	-	1	-	-	-	-	-	1	1
CO 2	2	2	-	2	2	-	1	-	-	-	-	-	1	1
CO 3	2	1	-	2	2	-	1	-	-	-	-	-	1	1
CO 4	-	1	-	2	2	-	1	-	-	-	-	-	1	1

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

Assessment Pattern(with revised Bloom's Taxonomy)

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

Government College of Engineering, Karad				
First Year (Semester – II) B. Tech. Electronics and Telecommunication Engineering.				
EX 3204: Transducers and Measurements				
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:

Course Outcomes (CO):

Students will be able to

1.	Understand the significance of calibration in maintaining measurement accuracy and traceability.
2.	Calculate the range and sensitivity of analog and digital meters based on their design parameters.
3.	Explain the functions and features of vertical and horizontal deflection systems in oscilloscopes.
4.	Develop the skills to select and configure appropriate bridge circuits for different measurement requirements.
5.	Choose and Compute, selection criteria and applications of various transducers used in measurement systems

	Course Contents	CO	Hrs
Unit 1	**Errors in Measurement and instrument classification.** –Errors-Types of Errors- Statistics of errors, Need for calibration. Classification of instruments, secondary instruments–indicating, integrating and recording operating forces - essentials of indicating instruments - deflecting, damping, controlling torques.	CO1	(06)
Unit 2	**Analog measurements:** Ammeters and voltmeters - permanent magnet moving coil (PMMC), moving iron (MIC), constructional details and operation, principles shunts and multipliers – extension of range.	CO2	(07)
Unit 3	**Digital measurements:** Digital Frequency Meter, Circuit for Measurement of Frequency. Resolution in Digital Meter Sensitivity of Digital Meters, Accuracy Specification of Digital Multi-meters, Digital L, C And R Measurements, Digital LCR Meter and Q Meter.	CO2	(07)
Unit 4	**Oscilloscopes**- Principal of operation of general purpose CRO-basics of vertical and horizontal deflection system, sweep generator etc. DSO-Characteristics-Probes and Probing techniques	CO3	(04)
Unit 5	**AC and DC Bridges**: Classification, measurement of low, medium and high resistance- Ammeter voltmeter method (for low and medium resistance)-Kelvin's double bridge (for low resistance), Wheat-stones bridge (for medium resistance), Loss of Charge method (for high resistance). Measurement of self-inductance-Maxwell's Inductance bridge, Measurement of capacitance – Schering's, bridge.	CO4	(08)
Unit 6	**Transducers** - Definition and classification. LVDT, Electromagnetic and Ultrasonic flow meters, Piezoelectric transducers-modes of operation-force transducer, Load cell, Strain gauge **Measurement of Physical Parameters**: Flow Measurement. Displacement Meters, Liquid level Measurement, Measurement of Humidity and Moisture, Velocity, Force, Pressure - High Pressure, Vacuum level, Temperature - Measurements, Data Acquisition Systems.	CO5	(08)
	Total Lectures		**40**

Text Books

1.	J. B. Gupta, A course in Electrical & Electronic Measurement & Instrumentation., S K Kataria & Sons
2.	Kalsi H. S., Electronic Instrumentation, 3/e, Tata McGraw Hill, New Delhi, 2012
Reference Books	
1.	Cooper W.D., Modern Electronics Instrumentation, Prentice Hall of India
2.	Golding E.W., Electrical Measurements & Measuring Instruments, Wheeler Pub
3.	A course in Electrical and electronics measurement and instrumentation by A.K. Sawhney, 2nd Edition by Dhan Patrai..
Useful Links	
1.	http://nptel.ac.in/courses/112103174/3
2.	https://nptel.ac.in/courses/108/108/108108147/
3.	Open Source Platform: https://www.tinkercad.com/

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	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO 1	3	2	1	1	1	-	-	-	-	-	-	1	1	2	-
CO2	3	2	2	1	1	-	-	-	-	-	-	1	-	2	1
CO 3	2	1	1	-	1	-	-	-	-	-	-	-	-	1	1
CO 4	2	2	2	1	2	-	-	-	-	-	-	-	-	1	1
CO 5	2	2	1-	1	1	-	-	-	-	-	-	-	-	1	1

Assessment Pattern: (with revised Bloom's Taxonomy)

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

GovernmentCollegeofEngineering,Karad

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

EX3205: 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:

- 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 assignments score (60% weightage) of registered NPTEL/SWAYAM and internal evaluation (40% weightage)
- The rubrics for internal evaluation is given below

Government College of Engineering, Karad

Department of Electronics and Telecommunication Engineering

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)	Contents (08 Marks)	Q & A (08 Marks)	Total Marks (Out of 40)

Government College of Engineering, Karad				
First Year (Semester – II) B. Tech. Electronics and Telecommunication Engineering.				
EX 3206- Engineering Physics Laboratory				
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	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
Experiment1	To study the volt-ampere characteristics of pn-junction and Zener diode, voltage regulator using Zener diode	**CO1, CO3**
Experiment2	To determine the velocity of ultrasonic waves in liquid medium by interferometer.	**CO2, CO4**
Experiment3	Find an object by Ultrasonic waves	**CO2, CO4**
Experiment4	To calculate the divergence of LASER beam.	**CO2, CO4**
Experiment5	Determination of wavelength of LASER using diffraction grating.	**CO2, CO4**
Experiment6	To study magneto resistance of n-type semiconductor	**CO1, CO3**
Experiment7	To study Hall effect in Semiconductor	**CO1, CO3**
Experiment8	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**
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 FeCl3 solution.	**CO1, CO3**
Experiment13	To verify Faradays Law	**CO1**
Experiment14	To verify Lenz's law	**CO1**
	Demonstration Experiment	
Experiment15	To synthesize Nanoparticles by spray Pyrolysis/CVDmethod	**CO4**
Experiment16	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	-	-

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

Government College of Engineering, Karad				
First Year (Sem – II) B. Tech. Electronics and Telecommunication Engineering				
EX3207: Data structure with C++				
Laboratory Scheme:			**Examination Scheme:**	
Lectures	2 Hrs/Week		**ISE**	50
Practical	2 Hrs/Week		**ESE**	50
Total Credits	3			

Prerequisite: Nil

Course Outcomes (CO):

Students will be able to

1.	Demonstrate proficiency in writing C++ programs using the correct syntax and language features.
2.	Design and implement object-oriented programs using classes, objects, and inheritance.
3.	Apply effectively exception and error handling techniques to ensure the reliability and robustness of programs.
4.	Develop modular and reusable code by applying good coding practices and design principles.

Course Contents		**Hrs**
Unit 1	**Object Oriented Programming:** Object oriented programming paradigm, Concepts of object-oriented programming. Applications of OOP. Beginning with C++: simple program and its structure, Defining Class & its structure,	**(03)**
Unit 2	**Array and Function:** Array of objects, passing objects to functions, returning object, Function, Friend function, friend class, public, private, Copy Constructor.	**(05)**
Unit 3	**Inheritance:** protected inheritance, Single inheritance, Multiple and multilevel inheritance, Hybrid inheritance, Abstract class, Virtual base class.	**(06)**
Unit 4	**Sequential Representation of Linear data structure:** Definitions, representation, priority queues, operations and their applications. Searching and Sorting Techniques, Linear search, Binary search, Bubble sort, insertion sort.	**(04)**
Unit 5	**Linked Representation of Linear data structure:** Definition, Representation, Operations and Applications of singly linked list, doubly linked list.	**(05)**
Unit 6	**Non-linear data structure (Trees):** Binary Tree, Traversal methods, Binary search tree, B tree,	**(05)**
Experiment 1	Implementation of class objects, constructor, destructor.	CO1
Experiment 2	Implementation of friend function and friend class.	CO1
Experiment 3	Implementation of inline function.	CO1
Experiment 4	Implementation of function over loading	CO3
Experiment 5	Implementation of single inheritance.	CO2,
Experiment 6	Write a program that implement Queue (its operations) using i) Arrays ii) Linked list (Pointers).	CO2' CO3
Experiment 7	Write a program that implements the following sorting i) Bubble sort ii) Selection sort	CO2 CO4
Experiment 8	Queue ADT using array.	CO1, CO3

Experiment 9	Write a program to perform the following operations: a) Insert an element into a binary search tree. b) Delete an element from a binary search tree. c) Search for a key element in a binary search tree.	CO3 CO4
Experiment 10	Write a program to implement the tree traversal methods	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	PSO3
CO 1	3	-	3	1	1	-	-	-	-	-	-	-	1	1	
CO 2	2	3	3	2	-	-	-	-	-	-	-	-	3	3	1
CO 3	2	3	3	3	2	-	-	-	-	-	-	-	3	3	1
CO 4	-	1	-	2	2	-	1	-	-	-	-	-	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	25	25	25	25	25	25	25	25	25	25	

Teaching Scheme			Examination Scheme	
Practical	04 Hrs/Week		**ISE**	50
Total Credits	02		**ESE**	50
			Duration of ESE	02:00 Hrs

Prerequisite: Nil

Course Outcomes (CO):

Students will be able to

1.	Identify the needs and requirements of scientists and engineers.
2.	Apply knowledge of basic components and mobility of mechanisms to analyze and design mechanisms
3.	Demonstrate proficiency in programming using platforms like Arduino.
4.	Utilize project management tools such as checklists, timelines, and Gantt charts.
5.	Understand the significance of professional ethics.
6.	Comprehend the principles of sustainability and sustainability leadership.

	Course Contents	CO
Unit 1	**Introduction to Engineering and Engineering Study:** Difference between science and engineering, scientist and engineer needs and wants, various disciplines of engineering, some misconceptions of engineering, Expectation for the 21st century engineer and Graduate Attributes.	CO1 CO2
Unit 2	**Engineering Design:** Engineering Design Process, Multidisciplinary facet of design, Pair wise comparison chart, Introduction to mechatronics system, generation of multiple solution, Pugh Chart, Motor and battery sizing concepts, introduction to PCB design	CO2
Unit 3	**Mechanisms:** Basic Components of a Mechanism, Degrees of Freedom or Mobility of a Mechanism,4 Bar Chain, Crank Rocker Mechanism, Slider Crank Mechanism.	CO3
Unit 4	**Platform based-development:** Introduction to various platform-based development (Arduino) programming and its essentials, Introduction to sensors, transducers and actuators and its interfacing with Arduino, Introduction to Data Acquisition and Analysis	CO4
Unit 5	**Project Management:** Introduction to Agile practices, Significance of teamwork, Project management tools: Checklist, Timeline, Gantt Chart, Significance of documentation	CO5
Unit 6	**Sustainability and Ethics in Engineering:** Introduction to sustainability, Sustainability leadership, carbon footprint Identifying Engineering as a Profession, Significance of Professional Ethics, Code of Conduct for Engineers, Identifying Ethical Dilemmas in different tasks of engineering, Plagiarism check for research papers	CO6

Mapping of COs and POs

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3

CO															
CO 1	2	1				1					1	1	1		
CO 2	2	2	2	1	1				3	1					
CO 3	2	2	3	2	2	1	1		3	1	2			1	
CO 4	2	2	2	2	2				1	1	2	1			
CO 5		2	2	2	2	1	1	1	3	1	3				1
CO 6						1	3	3							

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

Assessment Pattern: (with revised Bloom's Taxonomy)

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	30	30	30	30	30	30	30	30	30	30	
Task II	10	10	10	10	10	10	10	10	10	10	
Task III	10	10	10	10	10	10	10	10	10	10	
ISE	50	50	50	50	50	50	50	50	50	50	

Government College of Engineering, Karad

First Year (Sem – II) B. Tech. Electronics and Telecommunication Engineering

EX3209: National Cadet Corps

Teaching Scheme			Examination Scheme	
Lectures	04 Hrs/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
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.

Government College of Engineering, Karad

First Year (Sem – II) B. Tech. Electronics and Telecommunication Engineering

EX3209: 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 the community in which they work and the irrelation
2.	Identify the needs and problems of the community and involve them in problem-solving
3.	Develop capacity to meet emergencies and natural disasters
4.	Practice national integration and social harmony.
5.	Utilizetheirknowledgeinfindingpracticalsolutionstoindividualandcommunityproblems.

	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 from time to time . 8 Hrs	**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.	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, *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.	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=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
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. 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): 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 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.	**CO1, CO2, CO3, CO4**	60

	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. 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.	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_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
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
CO5	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

Government College of Engineering, Karad

First Year (Sem – II) B. Tech. Electronics and Telecommunication Engineering

EX3209: 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.	Utilizetheirknowledgeinfindingpracticalsolutionstoindividualandcommunityproblems.

	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.	Venkateshwara Rao and Udai Pareek,(Eds)Developing Entrepreneurship-A Handbook.
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	-	-	20
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Apply	-	-	10
Analyse	-	-	10
Evaluate	-	-	-
Create	-	-	-
Total	-	-	50