Government College of Engineering, Karad

(An Autonomous Institute of Government of Maharashtra)

Program: First Year Engineering

Curriculum for
First Year of B. Tech
(W.E.F. AY 2017-18)

Government College of Engineering Karad
First Year B. Tech
FE101 Engineering Mathematics-I

Teaching Scheme		**Examination Scheme**	
Lectures	3 Hrs/week	**CT1**	15
Tutorial	1 Hr/week	**CT2**	15
		TA	10
		ESE	60

Total Credits 3+1 = 4

Course Objectives

1. The basic necessity for the foundation of Engineering and Technology being mathematics, the main aim is to teach Mathematical methodologies and models.
2. To develop mathematical skills and enhance logical thinking power of students.
3. To provide students with skills in algebra which would enable students to obtain engineering solutions for given situations they may encounter in their profession.
4. To increase interest towards the use of Mathematics in engineering module.
5. To learn differential calculus which would enable students to find engineering solutions for given situations they may encounter in their profession.
6. To understand applications of differential calculus for engineering and Technology for which student able to find solutions for problems.

Course Contents

		Hours
Unit I	**Linear Algebra:** Basics of Matrix, Rank of matrix, Echelon form, Normal form, Inverse of matrix by partition method, Consistency and solution of simultaneous linear homogenous and Non-homogenous equations,	7
Unit II	**Applications of Linear Algebra:** Linear dependence and independence of vectors, Eigen values and Eigen vectors and their properties, Cayley -Hamilton theorem (without proof), Introduction of Reduction to diagonal form.	7
Unit III	**Differential Equations of the First Order and of the First Degree and its Applications:**	7

Exact differential equation, Equations reducible to exact equations, Linear equations, Equations reducible to Linear form, Applications to Orthogonal trajectories (Cartesian and Polar equations), Simple Electric Circuits

Unit IV **Successive Differentiation:**

n^{th} Order derivative of Standard functions, Leibnitz's theorem on n^{th} derivative of product of two functions, Expansion of functions by Taylor's series and Maclaurin's series, Indeterminate forms. 7

Unit V **Partial Differentiation:**

Partial derivatives, Euler's theorem on homogeneous functions, Total derivative, Change of variables, Partial derivatives of Composite, Parametric and implicit functions, Jacobian and its properties. 7

Unit VI **Applications of Partial derivatives:**

Jacobian of implicit functions, Partial derivatives implicit function using Jacobian, Errors and approximations, Maxima and Minima of a function of two variables, Lagrange's method of undetermined multiplier. 7

Course Outcome (CO):

1 Student able to think logically & understand the basic concepts.

2 Students formulate problem solving techniques for different mathematical models.

3 Exhibit various Engineering applications for topics included in the course.

4 Students able to solve problems in algebra

5 Students able to solve problems in differential calculus.

6 Students understand solving problems on application of partial derivatives.

Text Books

1 A Text Book of Applied Mathematics (Vol. I & II) by P.N. Wartikar and J.N.Wartikar, Pune Vidyarthi Griha Prakashan, Pune.

2 Advanced Engineering Mathematics (8th Edition) by Erwin Kreyszing, Wiley Eastern Ltd. Mumbai.

3 Advanced Engineering Mathematics by Peter O Neil Cengage Publications

References

1 Higher Engineering Mathematics by B.S.Grewal, Khanna Publication, New Delhi.

2 Higher Engineering Mathematics by H.K. Dass & Er. Rajneesh Verma (2^{nd} revised edition 2012) S.Chand Publication, New Delhi.

3 Higher Engineering Mathematics by B.V. Ramana, Tata McGraw-Hill

4 A Text Book of Engineering Mathematics, By Bali & Goyal (8^{th} Edition), Laxmi Publication.

5 Mathematical Methods of Science and Engineering(Aided with MATLAB) by Kanti B. Datta, by Cengage Learning

Useful Links

1 http://www.nptel.iitm.ac.in

2 www.ocw.mit.edu

Mapping of CO and PO

	A	B	C	d	e	F	f	H	i	J	k
CO1	√			√		√		√			√
CO2	√		√						√		√
CO3	√	√				√	√				√
CO4	√				√				√	√	
CO5	√		√					√			√
CO6					√		√			√	

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	1	1	0	10
Understand	2	2	2	10
Apply	3	3	3	10
Analyze	3	3	2	10
Evaluate	3	3	3	10
Create	3	3	0	10
Total	15	15	10	60

Government College of Engineering, Karad
First Year B. Tech
FE102: Engineering Physics

Teaching Scheme		**Examination Scheme**	
Lectures	4 Hrs/week	**CT1**	15
Total Credits	4	**CT2**	15
		TA	10
		ESE	60

Course Objectives

1. To teach fundamental understanding of basic principles of Physics through theory and their application in the field of Engineering.
2. Excel in technical careers and thrive in graduate studies using scientific principles and application of physical sciences.
3. Students demonstrate the ability to apply knowledge of physics in one area to make appropriate intellectual connections and solve problems in other areas of physics.
4. To insure that Engineering-Physics students are aware of the importance of physics in today's world and society.

Course Contents

		Hours
Unit I	**Acoustics and Ultrasonic's:** **Acoustics:** Acoustics of a building, Reverberations, Sabine Reverberation theory, Absorption coefficient, acoustic design of a Hall. **Ultrasonic's:** Introduction, production technique, Properties, Detection method, Determination of Wavelength and velocity, Engineering Application.	8
Unit II	**Elements of Crystal structure:** Introduction, Periodic array of atom (Space Lattice, Basis, Unit cell, Lattice parameter), Seven Crystal System, Bravais lattices, properties of unit cell, relation between density and lattice constant, symmetry elements in cube, Miller indices - procedure, features and sketches for different planes, X-ray diffraction, Bragg's law, Bragg's law and crystal structure.	10
Unit III	**Applied Optics:** **LASER** Interactions of external energy with the atomic energy states (Absorption, spontaneous emission and stimulated emission), pumping, population inversion, Metastable State, characteristics of laser, Ruby laser, Applications of laser, Holography. **Optical Fibre** Principle, structure, propagation of light through Optical Fibre (acceptance angle and acceptance cone), Fractional Refractive Index Change, numerical aperture, Classification of Optical Fibre, advantages of	10

Optical Fibre, Applications.

Diffraction Elementary theory of plane transmission grating, resolving power of grating.

Polarization Double refraction, positive and negative crystals, Laurent's half shade Polarimeter.

Unit IV **Magnetism and superconductivity:**

Magnetism Terminology (Magnetic Induction, Magnetic Field, Magnetization, Magnetic Susceptibility, Intensity of Magnetization, Relative permeability, relation between relative permeability and Magnetic Susceptibility) Origin of Magnetic Moment, Classification of magnetic Materials, Langevin's Theory, Hysteresis. 9

Superconductivity Introduction, Critical Temperature and Critical Magnetic Field, Meissner effect, Types of superconductors, BCS theory, Josephson effect, Engineering application of superconductor.

Unit V **Nuclear Energy:**

Introduction, energy released by 1 Kg. of U-235, explosive chain reaction and critical size, nuclear reactor and their classification, essentials of nuclear reactor. Nuclear fusion (p-p chain, c-n cycle), conditions for fusion reaction, fusion reactor. 9

Unit VI **Nano Physics:**

Introduction, Significance of Nanoscale (Surface area and Quantum Confinement effect), Fabrication of Nano materials, production techniques (Physical and chemical methods), Characterization (STM and AFM), Different types of Nanostructures, Carbon Nanotube - structure and types, properties and applications of nano-materials. 8

Course Outcomes (CO)

1 Understand the fundamental of Acoustics and Ultrasonic phenomenon and its Engineering applications
2 Build a base for a Crystal Structure.
3 Understand Applied Optics, Light Phenomenon and their characteristics and application for Engineering Technology.
4 Build a foundation of Magnetism and Superconductivity.
5 Aware of basic need of nuclear energy and its production techniques.
6 Understand the preface of Nano and its recent need in Engineering Technology

Text Books

1 V. Rajendran– Engineering Physics- Mc. Graw Hills
2 Vijayakumari- Engineering Physics-Vikas publication

3 B. K. Pandey and S. Chaturvedi- Engineering Physics, Cengage Learning-2012
4 "Nanotechnology: Principles and Practices" –SulabhaKulkarni

References

1 Solid State Physics : Structure & Electron Related Properties- S. O. Pillai, Eastern Ltd,, New Age International Ltd.
2 Introduction to Solid State Physics - Charles Kittle, Wiley India Pvt. Ltd.(8^{th}Edtion).
3 Fundamentals of physics -Alan Giambattista and others, Tata Mc. Graw Hills
4 Text Book of Optics – N. Subramanyam&Brijlal; (Vikas Publishing House Pvt.Ltd)
5 Nuclear Physics- S B Patel
6 Fundamentals of Magnetism- B.D.Cullity – Addison-Weseley Publishing
7 ResnickHalliday, Physics Volume-I, Krane -John Wiley & Sons Pub.

Useful Links

1 *en.wikipedia.org/wiki/Fundamentals_of_Physics*
2 www.hyperphysics.com
3 www.physicsclassroom.com
4 www.physicsworld.com
5 www.physics.org

Mapping of CO with PO

	a	b	c	d	e	f
CO1	√	√	√	√	√	√
CO2	√	-	-	√	√	√
CO3	√	√	√	√	√	√
CO4	√	√	√	√	-	-

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember			05	20
Understand	05	05	05	10
Apply	05	05		10
Analyze				10
Evaluate	05	05		10
Total	15	15	10	60

Government College of Engineering Karad
First Year B. Tech
FE111: Basic Electronics and Computer Programming (Revised w.e.f. A. Y. 2017-18)

Teaching Scheme		**Examination Scheme**	
Lectures	4 Hrs/week	**CT1**	15
Tutorial	-	**CT2**	15
Total Credits	4	**TA**	10
		ESE	60
		Duration of ESE: 2 Hrs 30 min	

Course Objectives:

This course aims to:

1. Understand basics of sequential & combinational logics
2. Examine fundamentals of various electronic components like testing, measurement, characteristic and applications
3. Recognize various transducers and measuring equipments
4. Understand basics of C programming
5. Understand fundamentals of arrays and string
6. Understand concept of structure and pointers

Course Contents

		Hours
Unit I	**Digital Electronics** A) Number systems: Inter-conversions of Decimal, Binary, Octal and Hexadecimal numbers. Binary Coded Decimal (BCD) system. B) Logic gates: Basic gates, Universal Gates, Boolean Algebra, Logic Families, Combinational logic: half adder, full adder, multiplexer and de-multiplexer; Sequential logic: Introduction to Counters, Shift Registers and Flip flops.	09
Unit II	**Semiconductor Devices and Applications** A) Introduction to Passive Components: Resistors - Fixed and Variable, Construction, Color coding, Specifications. Capacitors - Various Types, Construction, Color coding, Specifications Inductors - Types with Specification. B) Semiconductor Diode: Working Principle, VI characteristics, temperature dependence of VI characteristics, diode equivalent circuits, diode resistance and capacitance, various break down mechanisms. Introduction to special semiconductor diodes – Zener diode, PIN diode, Photo diode, LED (construction, characteristics, symbol and equivalent circuits).	09

Half wave & full wave rectifiers,
C) BJT:
Characteristics, load line, operating point, leakage currents, saturation and cut off mode of operations

Unit III Transducers, Measurements and Applications

A) Transducers:
Transducers for Displacement, level, Temperature, Pressure, Speed measurement, Range Specifications, Limitations.
B) Measuring Instruments:
Introduction to Volt meter, Ammeter, Ohm meter, Multimeter.
Cathode Ray Oscilloscope (CRO): Block diagram, working principle.
Measurement of voltage and frequency, component testing. 06

Unit IV Introduction to C language

Importance of 'C' Language, Sample 'C' Program, Structure of 'C' Program,Constants, variables and data types. Operators and expressions, Managing input / output operations, Decision making, branching and loop statements. Functions, Need for user defined functions, elements of User defined functions, defining functions, return values and their types, function calls, function declaration, methods of parameter passing 10

Unit V Arrays and String

Declaration and initialization of arrays, One dimensional and two
Dimensional arrays, reading, writing and manipulation of above types of arrays, multidimensional arrays. Declaring and initialing string variables, reading string from terminal, writing string to screen, string handling functions. Passing array and string to function. 06

Unit VI Structure and Pointer

Defining a structure, declaring structure variables, accessing structure
members, structure initialization, and array of structures, structures and functions. Understanding 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. 08

Course Outcome (CO):

Upon successful completion of this course, the student will be able to:

1 Select different electronic components for designing of digital and analog circuits
2 Use appropriate passive or active transducers for measurement of physical phenomenon.
3 Test and troubleshoot electronic circuits using various measuring instruments
4 Explain basics of c programming
5 Implement the concepts of function arrays and string
6 Apply the concepts of structure and pointers

Text Books

1. R S Sedha, S. Chand, "A Text Book of Applied Electronics", S.Chand (G/L) & Company Ltd; 2nd New edition (1 January 2000)
2. Floyd, "Digital Fundamentals", Pearson; 11 edition (14 July 2014).
3. H. S. Kalsi, "Electronic Instrumentation", McGraw Hill Education; 3 edition (28 June 2010)
4. E. Balguruswami, "Programming in ANSI C" ,Tata McGraw Hill, Seventh edition (1 August 2016)
5. Yashvant Kanetkar , "Let us C" BPB Publications; Thirteenth Revised and Updated edition (13 July 2016)

References

1. Robert L. Boylestad and Louis Nashelsky, "Electronics Devices and Circuit Theory", Pearson Education (US); Auflage: 5th Revised edition (October 1991)
2. A. Anand Kumar, "Fundamental of Digital Circuits", Prentice-Hall of India Pvt .Ltd; 3rd Revised edition edition (30 November 2014).
3. R. Prasad, "Fundamental of Electronics Engineering", Cengage Publication, first edition, 2011
4. B. Somnathan, "Electronic devices and applications", Phi Learning; 1 edition (2006)
5. B. L. Thareja, "Basic Electronics", S.Chand (G/L) & Company Ltd; 23rd Revised edition edition (1 June 2006)
6. B.W. Kernighan and D. M. Ritchie, "The 'C' Programming Language", PHI; 2 edition (22 March 1988)
7. ISRD Group, "Programming And Problem Solving Using C Language", McGraw Hill Education; 1 edition (18 January 2008)

Useful Links

1. http://nptel.ac.in/courses/117107095/
2. http://nptel.ac.in/courses/117103064/
3. http://cse02-iiith.vlabs.ac.in/
4. http://nptel.ac.in/courses/106106127/
5. https://www.youtube.com/watch?v=w8Dq8blTmSA&list=PL6A5175DB9EF79D22
6. https://www.youtube.com/watch?v=xhn188JafbM&list=PL350612601E2DBFDE
7. https://www.youtube.com/watch?v=g7vYop_46tU&list=PLxkD1n1d5cJJv8kwjB_Se7lAFQMMjQ3BC
8. https://www.youtube.com/watch?v=1uPTyjxZzyo

Mapping of CO and PO

	PO												PSO	
	a	**b**	**C**	**d**	**e**	**f**	**g**	**h**	**i**	**J**	**k**	**l**	**m**	**n**
CO1	√	√	√	√	√	√			√	√	√	√		√
CO2	√	√	√	√	√	√			√		√	√	√	
CO3	√	√		√	√	√			√	√	√	√	√	
CO4	√	√			√				√	√	√	√	√	
CO5	√	√	√	√	√				√	√	√	√	√	√
CO6	√	√	√	√	√				√	√	√	√	√	√

Assessment Pattern

Knowledge Level	**CT1**	**CT2**	**TA**	**ESE**
Remember	√	√	√	√
Understand	√	√	√	√
Apply	√	√	√	√
Analyze	√	√	√	√
Evaluate	√	√	√	√
Create				

Government College of Engineering, Karad
First Year B. Tech.
FE104: Engineering Graphics

Teaching Scheme		**Examination Scheme**	
Lectures	3 Hrs/week	**CT1**	15
Total Credits	3	**CT2**	15
		TA	10
		ESE	60

Course Objectives

1. To learn the use of different types of drawing instruments, pencils, representation of letters, numbers and title block, symbols and conventions in Engineering Drawing
2. To know about different types of planes of projections (FRP, HRP,PRP), projection methods, viz., 1st angle and 3rd angle
3. To know projection of points, straight lines, planes and different types of lines and planes
4. Students will able to gain knowledge on plane, solids like cylinder, sphere, cone, pyramid, prism, frustum of these objects, etc.
5. To know about projections of solids, viz., orthographic, oblique, isometric, perspective projections
6. To know development of different types of surfaces

Course Contents

Course Outline:

Engineering drawing is a basic course for all undergraduate engineering programs. Engineering drawing is considered as the language of engineers. This course is aimed at providing basic understanding of the fundamentals of Engineering Drawing; mainly visualization, graphics theory, standards and conventions of drawing, the tools of drawing and the use of Drawings in engineering applications.

Unit I **Unit1: Fundamentals of Engineering Graphics& Engineering Curves**

A) Fundamentals of Engineering Graphics: Introduction to Drawing instruments and their uses. Layout of drawing sheets, different types of lines used in drawing practice, Dimensioning system as per BIS (Theoretical treatment only)

B) Engineering curves: Construction of regular polygons (up to hexagon). Construction of Ellipse, Parabola, Hyperbola, Involutes, Archimedean spiral and Cycloid only. 6

Unit II **Projections of lines & Planes** 10

A) Projections of lines: Introduction to First angle and third angle methods of projection.

Projections of points on regular reference planes. Projections of horizontal, frontal and Profile lines on regular and auxiliary reference planes. Projection of oblique lines it's True length and angle with reference planes by rotation and auxiliary plane method. Concept of grade and bearing of line, Point View of a line, Projections of intersecting lines, Parallel lines, perpendicular lines and skew line.

B) Projections of planes: Projections on regular and on auxiliary reference planes. Types of planes (horizontal, frontal, oblique and Profile planes). Edge view and True shape of a Plane. Angles made by the plane with Principle reference planes. Projections of plane figures inclined to both the planes. (Circle and regular polygon)

Unit III **Projections of solids**

Projections of Prisms, Pyramids, Cylinder and Cones inclined to both reference planes (Excluding frustum and sphere) 5

Unit IV **Orthographic Projections**

Orthographic views: lines used, Selection of views, spacing of views, dimensioning and sections. Drawing required views from given pictorial views (Conversion of pictorial view into orthographic view) including sectional orthographic view. 7

Unit V **Isometric projections**

Isometric projections: Introduction to isometric, Isometric scale, Isometric projections and Isometric views / drawings. Circles in isometric view. Isometric views of simple solids and objects. 7

Unit VI **Sections of solids and Development of surfaces**

A) Sections of solids: Prisms, Pyramids, Cylinders and Cones (Simple positions and inclined to one plane and parallel to other)

B) Development of plane and curved surfaces: Prisms, Pyramids, Cylinders and Cones along with cutting planes. 7

Course Outcomes (CO):

After completion of **Engineering Graphics** the student will be able to

1. Identify basic concepts in drawing and its application.(1st Level Boom's cognitive)
2. Illustrate different methods of projection.(2nd Level Boom's Cognitive)
3. Sketch projection of simple geometries [point, line, planes].(3rd Level Boom's cognitive)
4. Show ability of imagination to draw isometric and orthographic projection.(2nd level Bloom's cognitive)
5. Apply the drawing to understand complicated machine component.[i.e., orthographic projection and isometric projection].(3rd Level Boom's Cognitive)
6. Sketch their concepts by using the engineering drawing.(3rd Level Boom's cognitive)
7. Recognize its function in multi-disciplinary project teams,(1st Level Boom's cognitive)
8. Sketch projection of solids, sectional views of solids and development of lateral surfaces of solids.(3rd Level Boom's Cognitive)

Text Books

1. N. D. Bhatt, Engineering Drawing, Charotar Publication House, Bombay
2. W. J. Luzadder, Fundamentals of Engineering Drawing, Prentice Hall of India.
3. K. Venugopal, Engineering Drawing and Graphics, New Age Publication
4. Engineering Design and Visualization by Jon M. Duff, William A. Ross, CENGAGE Learning
5. Engineering Drawing by N. B. Shaha and B. C. Rana, Pearson Education.
6. Machine Drawing by N. D. Bhatt, Charotar Publication House, Bombay.
7. Mastering AutoCAD 2015 and AutoCAD LT 2015: Autodesk Official Press, by George Omura, Wiley Publication

References

1. Machine Drawing by K. L. Narayana, New Age Publication
2. French and Vierck, Graphic Science, Mc-Graw Hill International

3 Engineering Drawing by Prof. Amar Pathak, WIELY India Publication

Useful Links

1 http://web.iitd.ac.in/~achawla/public_html/201/lectures/sp46.pdf

2 http://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/env_health_science_students/EngineeringDrawing.pdf

Mapping of CO and PO

	a	b	c	d	e	f	g	h	i	j	k	l
CO1	√			√								
CO2	√	√										
CO3	√			√								
CO4	√	√					√			√	√	
CO5	√		√		√	√	√	√	√	√	√	
CO6	√	√			√		√		√	√	√	
CO7				√			√					
CO8	√	√	√			√	√	√				

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	2	2	2	10
Understand	2	2	2	10
Apply	3	3	3	15
Analyse	3	3	3	10
Evaluate	2	2	2	-
Create	3	3	3	15
Total	15	15	10	60

Government College of Engineering Karad.
First Year B. Tech
FE105:Basic Civil Engineering

Teaching Scheme		**Examination Scheme**	
Lectures	3 Hrs/week	**CT1**	15
Total Credits	3	**CT2**	15
		TA	10
		ESE	60

Course Objectives

1 To study branches and application of civil engineering
2 To study Building Planning and Byelaws & regulations as per SP-7.
3 To study Components of Buildings and its function
4 To study Building Design criteria
5 To study building materials
6 To study surveying and levelling
7 To study basic of Infrastructure in civil Engineering

Course Contents

		Hours
Unit I	Introduction, background and history, branches of civil engineering, application of civil engineering in other allied fields. Building Planning :Principles of planning, orientation of buildings, introduction to Bye-Laws regarding building line, height of building, open space requirements, F.S.I., setbacks, ventilation, sanitation as per municipal corporation area requirement	07
Unit II	Components of Buildings : • Sub-structure Types of soil and rocks as foundation strata, concept of bearing capacity, types of foundations i.e. shallow and deep and their suitability. Shallow foundation such as wall foundation, isolated foundation, deep foundation such as pile foundation. • Super- of super-structures and their functions	07
Unit III	Building Design : Introduction to types of loads, concepts of strength, stability, durability and factor of safety of building, load bearing and framed structures Building Materials :Use and properties of the following materials : • Concrete – ingredients and grades, plain and reinforced cement concrete and ready mix concrete, bricks, steel, aluminum, plastic, timber, roofing materials etc.	07
Unit IV	Surveying : • Principles of surveying • Classification of surveys • Chain Surveying Introduction to metric chain and tapes, error in chaining, nominal scale and R.F., ranging, chaining and offsetting, index plan, location sketch and recording of field book • Chain and compass survey	08

Meridian, bearing and its types, system of bearing,
Types of compass : prismatic and surveyor's compass.
Calculation of included angles, correction for local attraction

Unit V Levelling :
• Terms used in leveling, use of Dumpy level, temporary adjustments.
methods of reduction of levels, types of levelling,
Contours, characteristics of contours, use of contour maps.
• Introduction to Auto level and use
• Introduction and use of EDM's with special reference to Total Station.
• Measurement of area by digital planimeter. 07

Unit VI Introduction to Infrastructure
• Transportation Systems
• Water resources systems
• Public Buildings
• Supply chain management systems
•water supply and sanitation systems. 06

Course Outcomes (CO):

1 Understand branches and application of civil engineering
2 Implement Building Planning and Byelaws & regulations as per SP-7
3 Understand Components of Buildings& its function
4 Understand Building Design criteria
5 Understand properties of building materials
6 Understand how to carry out surveying and levelling
7 Understand the Infrastructures in civil Engineering

Text Books

1 Ramamrutham, Basic Civil Engineering by DhanpatRai Publication.
2 Building Design by Bindra and Arora.
3 N. Basak, Surveying, Tata Mc-Graw Hill Publication.
4 B.C. Punmia, Surveying, Vol.- I, Vol.-II

References

1 National Building code SP-7.
2 Civil Engineering Materials - Technical Teacher's Training Institute, Chandigarh

Mapping of CO and PO

	a	b	c	d	e	f	g	h	i	J	k
CO1	√				√	√				√	
CO2		√	√					√	√		
CO3			√		√		√				√
CO4	√		√	√		√		√	√		
CO5	√				√		√				
CO6	√		√	√					√	√	√
CO7						√		√			√

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	3	3	2	12
Understand	3	3	2	12
Apply	3	3	2	12
Analyze	3	3	2	12
Evaluate	3	3	2	12
Total	15	15	10	60

Government College of Engineering Karad
First Year B. Tech
FE106: Engineering Physics Lab

Laboratory Scheme		**Examination Scheme**	
Practical	2 Hrs/week	**CA**	50
Total Credits	1		

Course Objectives

1	To teach fundamental understanding of basic principles of Physics through practice and their application in the field of Engineering.
2	Students demonstrate competence in the physics laboratory, including a working knowledge, techniques, skills and the ability to work independently.
3	Students demonstrate the ability to design and conduct experiments, as well as to analyze and interpret data.
4	Students demonstrate a familiarity with the current state of research in one or more subfields of physics.

Course Contents

Experiment 1	Verification of Inverse square Law of illumination.
Experiment 2	To determine the energy band gap of semiconductor using a reverse biased PN junction diode.
Experiment 3	To determine the specific rotation of given sugar solution by Lorentz's half shade polarimeter.
Experiment 4	To determine the resolving power of telescope.
Experiment 5	Study of symmetry elements of cube.
Experiment 6	To determine the wavelength of Violet, Green, Yellow light by using plane transmission grating
Experiment 7	To determine the number of atom per unit cell, atomic radius, packing factor and Co-ordination number of different crystal system.
Experiment 8	To determine the wavelength of LASER by using plane transmission grating
Experiment 9	To determine the lattice constant using the given X-ray differaction pattern of powder specimen.
Experiment 10	Find an object by Ultrasonic waves.
Experiment 11	Study of Planes with the help of models related Miller Indices.
Experiment 12	To Study Fundamental of magnetism.
Experiment 13	To study behaviour of Hysteresis loop.
Experiment 14	Hall effect in Semiconductor
Experiment 15	Measurement of e/m of an electron by Thomson's method.
Experiment 16	To study Fundamental of Solar cell

List of Submission

1 Total number of Experiments : 10

Course Outcomes (CO)

1. Understand Relevance of Ultrasonic waves.
2. Hands on experience over theory of crystal structure and its related parameters.
3. Understand the fundamental of LASER .
4. Build a basic foundation to magnetism and Solar cell.
5. Verify different Laws.
6. Understand Optical and Polarization Phenomenon.
7. Understand the preface of Nano.

Mapping of CO and PO

	a	b	c	d	e	f	g
CO1	√	√	√	√	√	√	√
CO2	√	√	√	√	√	√	√
CO3	√	√	√	√	√	√	√
CO4	√			√	√		√

Assessment Pattern

Skill Level	Exp 1	Exp 2	Exp 3	Exp 4	Exp 5	Exp 6	Exp 7	Exp 8	Exp 9	Exp 10	CA
Assembling											
Testing											
Observing/ implementing	√	√	√	√	√	√	√	√	√	√	
Analyzing	√	√	√	√	√	√	√	√	√	√	
Interpreting											
Designing											
Creating											
Deducing conclusions											

Government College of Engineering Karad
First Year B. Tech
FE107: Computer Programming Lab

Laboratory Scheme		**Examination Scheme**	
Practical	2 Hrs/week	**CA**	50
Total Credits	1		

Course Objectives

1 To compile and run basic C program.
2 To apply fundamentals of arrays and string using c program.
3 To implement concept of structure and pointers.

Course Contents

Experiment 1 Program for basic arithmetic operations like addition, subtraction, multiplication, division and expressions like $y=2x^2+x+3$.

Experiment 2 Program for calculator which performs basic arithmetic operations like addition, subtraction, multiplication, division of a two number by using if else and switch case.

Experiment 3 Program for Finding factorial of a number provided by the user.

Experiment 4 Program for calculating area of circle, triangle, rectangle, square by passing argument to a function.

Experiment 5 Program for finding smallest and largest numbers from given 3 numbers from array.

Experiment 6 Program for performing matrix operation addition, subtraction using array.

Experiment 7 Program for performing string operations using string handling functions.

Experiment 8 Program for storing and displaying student record using array of structure.

Experiment 9 Program for passing structure as an argument to a function.

Experiment 10 Program for Swapping of two numbers using call by value and call by reference.

List of Submission

1 Total number of Experiments : 10

Course Outcomes(CO):

1 Implement basic c programming concepts.
2 Analyze program behaviour and errors for different set of inputs
3 Solve various problem statements by using c programming.

Mapping of CO and PO

	a	b	c	d	e	f	g	h	i	j	k
CO1		√									
CO2			√								
CO3		√									

Assessment Pattern

Skill Level	Exp 1	Exp 2	Exp 3	Exp 4	Exp 5	Exp 6	Exp 7	Exp 8	Exp 9	Exp 10	CA
Assembling											
Testing											
Observing/ implementing	√	√	√	√	√	√	√	√	√	√	√
Analyzing	√	√	√	√	√	√	√	√	√	√	√
Interpreting											
Designing											
Creating											
Deducing conclusions											

Government College of Engineering, Karad

First Year B. Tech.

FE108: Engineering Graphics Lab

Laboratory Scheme | **Examination Scheme**
Practical 2 + 2 Hrs/week | **CA** 50 + 50
Total Credits 2

The course shall consist of two parts viz. A) Drawing sheets manually and B) Computer Aided Drawing. Though both the components shall be evaluated separately for 50 marks each, passing the course and grade shall depend on combined marks.

A) Course Objectives

1 Understand and appreciate the importance of Engineering Graphics in Engineering
2 Understand the basic principles of Technical/Engineering Drawing. To improve the visualization skills.
3 To enable the students with various concepts like dimensioning, conventions and standards related to working drawings in order to become professionally efficient
4 To impart the knowledge on understanding and drawing of simple residential/office buildings.

Course Contents

Sheet No.1 Engineering curves
Sheet No.2 Projections of lines
Sheet No.3 Projections of planes
Sheet No.4 Orthographic projections
Sheet No.5 Isometric projections
Sheet No.6 Projections of solids
Sheet No.7 Sections of solids and Development of Plane and curved surfaces of solids

List of Submission

1 Total number of sheets 07

Course Outcomes (CO):

After completion of the course the student will be able to
1 Draw the projections for visualization of various engineering parts
2 Develop competence in correct expression of the visualized objects.
3 Get insight of the technical drawing.
4 Understand application of the drawing to practical problems

Mapping of CO and PO for A

	A	b	C	d	e	f	g	h	i	j	k	i
CO1	√	√		√		√						
CO2		√	√	√	√	√			√	√	√	
CO3	√		√	√		√		√		√	√	
CO4	√		√		√	√	√	√	√		√	

Assessment Pattern for A

Skill Level	Exp 1	Exp 2	Exp 3	Exp 4	Exp 5	Exp 6	Exp 7	CA
Assembling								
Testing								
Observing	√	√	√	√	√	√	√	10
Analysing	√	√	√	√	√	√	√	10
Interpreting	√	√	√	√	√	√	√	10
Designing	√	√	√	√	√	√	√	10
Creating	√	√	√	√	√	√	√	10
Deducing conclusions								

B) Course Objectives

1 To aim computer-aided drawing skill of the 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 2 demonstrates ideas and design concepts using drafting software.

Course Contents

Experiment 1 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.

Experiment 2 Drawing of a Title Block with necessary text and projection symbol.

Experiment 3 Drawing of curves like parabola, spiral, involute using Bspline or cubic spline.

Experiment 4 Drawing of front view and top view of simple solids like prism, pyramid, cylinder, cone, etc., and dimensioning.

Experiment 5 Drawing front view, top view and side view of objects from the given pictorial views (e.g. simple 3D Objects with hole and curves).

Experiment 6 Drawing a plan of residential building (Two bed rooms, kitchen, hall, etc.

Experiment 7 Drawing of a simple steel truss.

Experiment 8 Drawing sectional views of prism, pyramid, cylinder, cone, etc.

Experiment 9 Drawing isometric projection of simple objects.

List of Submission

1 Total number of sheets 09

Course Outcomes (CO):

After completion of the course the students will be able to

1 Draw the AutoCAD's two dimensional drawings.
2 Know the office practice and standards.
3 Establish relationship between traditional drafting technique and computer aided drafting.

Mapping of CO and PO for B

	a	b	c	d	e	f	g	h	i	j	k	i
CO1	√	√				√		√	√	√	√	
CO2	√											
CO3	√	√	√	√	√	√	√	√		√	√	

Assessment Pattern for B

Skill Level	Exp 1	Exp 2	Exp 3	Exp 4	Exp 5	Exp 6	Exp 7	Exp 8	Exp 9	CA
Assembling										
Testing										
Observing	√	√	√	√	√	√	√	√	√	√
Analysing	√	√	√	√	√	√	√	√	√	√
Interpreting	√	√	√	√	√	√	√	√	√	√
Designing	√	√	√	√	√	√	√	√	√	√
Creating	√	√	√	√	√	√	√	√	√	√
Deducing conclusions										

Government College of Engineering Karad
First Year B. Tech
FE109:Basic Civil Engineering Lab

Laboratory Scheme **Examination Scheme**
Practical 2 Hrs/week **CA** 50
Total Credits 1

Course Objectives
1 Study use of chains for Surveying
2 Study use of prismatic compass
3 Study bearing and Included Angles
4 Study of Dumpy level
5 Study of Collimation Plane Method
6 Study of Rise and Fall Method
7 Study Digital instruments like Planimeter, EDM instruments and Total Station

Course Contents
Experiment 1 Chaining, ranging and offsetting.
Experiment 2 Plotting of closed traverse by prismatic compass
Experiment 3 Study of Bearing and Included Angles
Experiment 4 Study of Dumpy level
Experiment 5 Collimation Plane Method
Experiment 6 Rise and Fall Method
Experiment 7 Study Digital Planimeter, Electronic Distance Measurement instrument and Total Station
Experiment 8 Site visit to study components of building.

List of Submission
1 Total number of Experiments: 8
2 Field Visit Report: 2

Course Outcomes (CO):
1 Understand use of chains for Surveying
2 Understand use of prismatic compass
3 Understand bearing and Included Angles
4 Understand basics Dumpy level
5 Understand Collimation Plane Method
6 Understand of Rise and Fall Method
7 Study Digital instruments like Planimeter, EDM instruments and Total Station

Mapping of CO and PO

	a	b	c	d	e	f	g	h	i	j	k
CO1					√			√		√	
CO2			√		√			√		√	
CO3		√						√		√	
CO4			√		√			√		√	
CO5		√			√			√		√	
CO6		√			√			√		√	
CO7		√						√		√	

Assessment Pattern

Skill Level	Exp 1	Exp 2	Exp 3	Exp 4	Exp 5	Exp 6	Exp 7	Exp 8	CA
Assembling	√	√			√	√			5
Testing					√	√			5
Observing	√	√		√	√	√	√	√	10
Analyzing		√	√	√	√	√	√	√	10
Interpreting	√		√		√	√	√		10
Designing									0
Creating		√							5
Deducing conclusions					√	√			5

Government College of Engineering, Karad
First Year B. Tech.
FE110: Workshop Practice – I

Laboratory Scheme		**Examination Scheme**	
Practical	2 Hrs/week	**CA**	50
Total Credits	1		

Course Objectives **Hours**

1. To develop hands-on skills, workmanship and workshop practices
2. Learn to use various hand tools for fitting, carpentry, tin-smithy, black-smithy, plumbing, welding, etc.
3. Reading and preparing simple drawings / sketches
4. Using various measurement and marking tools

Course Contents

Experiment 1 **Safety:** Concept of accidents causes of accidents, safety precautions while working in shop, safety equipments and their use.

Measuring Instruments: Brief introduction to instruments like – Steel rule, Calipers, Vernier Caliper, Micrometer, Dial Gauge, Vernier height Gauge etc. Least counts, common errors and care while using them, Use of marking gauge, 'V' block and surface plate. **2**

Experiment 2 **Smithy:** Introduction to smithy operations like- bending, forming, upsetting, drawing. Smithy tools, hammer, hot & cold chisel flatters, tongs, anvil etc.

- **Smithy:** One job in smithy involving upsetting, Drawing, bending such as- Hook, peg, square headed bolt etc. **2**

Experiment 3 **Fitting:** Study of various tools like- files, drills, taps, dies. Fitting operations. The term work consists of assignment on safety, measuring instruments, Smithy and fitting.

- **Fitting:** One job Male/Female fitting with operations- Marking, cutting, drilling, tapping filing etc. **2**

Experiment 4 **Basic Electronics:** Demonstration and use of electrical and electronics hand and power tools.

Measurement of resistor and capacitor, measurement of voltage and frequency using oscilloscope. **2**

Experiment 5 Assembly of Electronic components on the printed circuit board (PCB)/Bread Board.

Experiment 6 Demonstration and performance measurement of any two electronic components / devices –

a. Diodes
b. Transistor
c. Logic gates **2**

List of Submission

1. Total number of Jobs- 02
2. Total number of Performance Experiment- 02

Course Outcomes (CO):

On successful completion of **Workshop Practice – I** the student will be able to:

1. Demonstrate an understanding of and comply with workshop safety regulations

2 Identify and use marking tools, hand-tools, measuring instruments (mechanical and electrical) and to work to prescribed dimensions/tolerances
3 Develop creativity, imagination, confidence and appreciation for workmanship
4 Develop skills for smithy, fitting and soldering electronic components on PCB
5 To enhance psycho motor skills and attitude.

Mapping of CO and PO

	a	b	c	d	e	f	g	h	i	j	k
CO1						√				√	
CO2		√			√	√			√	√	
CO3	√	√		√	√				√		
CO4	√	√	√	√	√		√	√			√
CO5			√	√			√	√			√

Assessment Pattern

Skill Level	Job 1	Job 2	CA
Assembling	5	5	5
Testing	5	5	5
Observing	5	5	5
Analyzing	5	5	5
Interpreting	10	10	10
Designing	10	10	10
Creating	10	10	10
Deducing conclusions			

Government College of Engineering Karad

First Year B. Tech

FE201 Engineering Mathematics-II

Teaching Scheme		**Examination Scheme**	
Lectures	3 Hrs/week	**CT1**	15
Tutorial	1 Hr/week	**CT2**	15
		TA	10
		ESE	60

Total Credits 3+1 = 4

Course Objectives

1. The basic necessity for the foundation of Engineering and Technology being mathematics, the main aim is to teach Mathematical methodologies and models.
2. To develop mathematical skills and enhance logical thinking power of students.
3. To provide students with skills in Differential calculus which would enable students to obtain engineering solutions for given situations they may encounter in their profession.
4. To increase interest towards the use of Mathematics in engineering module.
5. To learn Integral calculus which would enable students to find engineering solutions for given situations they may encounter in their profession.
6. To understand applications of Integral calculus for engineering and Technology for which student able to find solutions for problems.

Course Contents

		Hours
Unit I	**Complex Numbers:** De Moivre's Theorem, Roots of Complex number by De Moivre's theorem, Expansions of $sinn\theta$ and $cosn\theta$ in powers of $sin\theta, cos\theta$ and Expansions of $sin^n\theta, cos^n\theta$ and $sin^m\theta cos^n\theta$ in a series of sines or cosines of multiples of θ,	7
Unit II	Circular functions, Hyperbolic functions, Relation between circular and hyperbolic functions, Inverse hyperbolic functions, Separation of real and imaginary parts, Logarithm of complex number.	7
Unit III	**Numerical Solutions of Ordinary Differential Equations of the First Order:** Numerical Solutions by Picard's method, Taylor's series method, Modified Euler's method, Runge-Kutta forth order Method,	7

Milne's Method, Adams-Bashforth method.

Unit IV **Special Functions and Curve Tracing and Rectification:**

Beta, Gamma Functions, Properties of Beta, Gamma Functions, Differentiation under integral sign, Tracing of Curves in Cartesian form (Standard curves only), Tracing of Curves in Polar form (Standard curves only), Rectification of plane curves (Cartesian and Polar). 7

Unit V **Multiple Integrals:**

Introduction of Double Integrals, Evaluation of Double Integrals, Change of Order of Integration, Transformation of variables using Jacobian ,Change into Polar, Evaluation of Triple Integrals with given limits, 7

Unit VI **Applications of Multiple Integrals**:

Area under curves using Double Integral, Mass of Lamina, Moment of Inertia of a Plane Lamina, Volumes of Solids as double integrals, Volume as triple integral. 7

Course Outcome (CO):

1 Student will able to think logically & understand the basic concepts.

2 Students will able to solve problems regarding Differential calculus which would enable students to obtain engineering solutions.

3 Students formulate problem solving techniques for different mathematical models.

4 Exhibit various Engineering applications for topics included in the course.

5 Students will able to solve problems regarding Integral calculus which would enable students to obtain engineering solutions for given situations

6 Students will able to solve problems regarding Integral calculus which would enable students to obtain engineering solutions.

Text Books

1 A Text Book of Applied Mathematics (Vol. I & II) by P.N. Wartikar and J.N.Wartikar, Pune Vidyarthi Griha Prakashan, Pune.

2 Advanced Engineering Mathematics (9^{th} Edition) by Erwin Kreyszing, Wiley Eastern Ltd. Mumbai.

3 Advanced Engineering Mathematics by Peter O Neil Cengage Publications

References

1 Higher Engineering Mathematics by B.S.Grewal, Khanna Publication, New Delhi.

2 Higher Engineering Mathematics by H.K. Dass & Er. Rajneesh Verma (2^{nd} revised edition 2012) S.Chand Publication, New Delhi.

3 Higher Engineering Mathematics by B.V. Ramana, Tata McGraw-Hill

4 A Text Book of Engineering Mathematics, By Bali & Goyal (8^{th} Edition), Laxmi Publication.

5 Mathematical Methods of Science and Engineering (Aided with MATLAB) by Kanti B. Datta, by Cengage Learning.

Useful Links

1 http://www.nptel.iitm.ac.in

2 www.ocw.mit.edu

Mapping of CO and PO

	A	B	c	d	e	f	F	h	i	J	k
CO1	√			√		√		√		√	
CO2			√								√
CO3	√	√		√			√			√	
CO4					√				√		
CO5	√		√								
CO6	√	√			√		√				√

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	1	1	0	10
Understand	2	2	1	10
Apply	3	3	3	10
Analyze	3	3	1	10
Evaluate	3	3	3	10
Create	3	3	2	10
Total	15	15	10	60

Government College of Engineering Karad
First Year B. Tech
FE 202:Engineering Chemistry

Teaching Scheme		Examination Scheme	
Lectures	3 Hrs/week	**CT1**	15
Tutorial	--	**CT2**	15
Total Credits	3	**TA**	10
		ESE	60

Course Objectives

1. Technology involved in improving quality of water for industrial as well as domestic use
2. Study of synthesis, chemical structure of polymers and its effect on their properties when used as engineering materials.
3. Study of Advanced Energy Material and derived fuels with its properties and applications.
4. An insight into nano materials and composite material aspect of modern chemistry.

Course Contents

		Hours
Unit I	**Water** Introduction, impurities in natural water, water quality parameters total solids, acidity, alkalinity, chlorides, and dissolved oxygen (definition, causes, significance), hardness of water (causes, types, units of hardness), ill effects of hard water in steam generation in boilers, numerical problems on hardness, treatment of hard water by ion exchange process, Reverse Osmosis, Waste Water treatment (Effluent Treatment Plant), Water Crisis and Their Management.	**7**
Unit II	**2:Instrumental methods of chemical analysis** Introduction, advantages and Limitation of instrumental methods. **A) pH-metry:** Introduction, pH measurement using glass electrode, applications of pH-metry. **B)Advanced Spectrometry:** Introduction, Laws of spectrometry (Lamberts and Beer-Lambert's law), Advanced Spectroscopic techniques Basic and Application of IR, NMR, XRD techniques	8

Chromatography
(GLC), basic principle, instrumentation and applications. HPLC (High Performance Liquid Chromatography).

Unit III **3:Advancedmaterials**

A)Polymers: Introduction, plastics, thermosoftening and thermosetting plastics, industrially important plastics like phenol formaldehyde, urea formaldehyde and epoxy resins, conducting polymers (doping, conjugation, conductivity), examples and applications, biodegradable plastics.

B) Nanomaterials: Introduction, synthesis and applications**.** CNT (Carbon Nanotubes), Graphene

C) Composite materials: Introduction, constituents, types of composites, advantages, composition, properties and uses of fiber reinforced plastics (FRP) and glass reinforced plastic (GRP),Ecofreindly building Materials like Hybrid pigment etc 7

Unit IV **4.Advanced Energy Materials**

Introduction, classification, calorific value, definition, units (calorie, kcal, joules, kilojoules), characteristics of good fuels, comparison between solid, liquid and gaseous fuels, types of calorific value (higher and lower), Bomb calorimeter and Boys calorimeter. Numerical on Bomb and Boys calorimeter. , Fuel cells: (H_2-O_2fuel cell) Introduction, classification,

Solar Cell, Photo catalysis of Water for H_2 generation 7

Unit V **5:Corrosion:**

Introduction, causes, classification, atmospheric corrosion (oxidation corrosion), electrochemical corrosion (hydrogen evolution and oxygen absorption mechanism), factors affecting rate of corrosion. Prevention of corrosion by proper design and material selection, hot dipping (galvanizing and tinning), cathodic protection, metal spraying and electroplating. 7

Unit VI **6:Metallic materials & Green Chemistry**

A) Metallic materials: Introduction, alloy definition and classification, purposes of making alloys. Ferrous alloys: Plain carbon steels (mild, medium and high), stainless steels. Nonferrous alloys: Copper alloy (Brass), Nickel alloy (Nichrome), Aluminium alloy (Duralumin and Alnico), Tin 7

alloy (Solder metal).

B) Green Chemistry: Definition, goals of green chemistry, significance, basic components of green chemistry research, industrial applications, traditional and green pathways for synthesis chemical synthesis

Course Outcome (CO):

1 Needs of water for domestic and industrial purposes
2 Instrumental techniques which widely used in industries for chemical analysis
3 Advanced materials which used in day today life with different properties
4 On calorific value fuel is selected
5 How corrosion of metal takes place and how it will be prevented
6 Why alloys are prepared and role of green chemistry in our life

Text Books/Reference books

1 Engineering Chemistry by Jain and Jain, Dhanpat Rai Publishing Company Ltd., New Delhi.
2 A Textbook of Engineering Chemistry by S. S. Dara and S. S. Umare, S. Chand & Company Ltd., New Delhi.
3 Chatwal and Anand, Instrumental Methods of Chemical Analysis, Himalaya Publishing House, New Delhi.
4 A text Book of Engineering Chemistry by Shashi Chawla, Dhanpat Rai& Co. (Pvt.) Ltd, Delhi.
5 Engineering Chemistry by Wiley India.Engineering Chemistry by Renu Bapna and Renu Gupta, MacMillan Publishers (India) Ltd, Delhi.

Useful Links

1 Geopolymer institute Website www.geopolymer.org
2 www.acs.org/.../green chemistry/...green-chemistry/principles/12-principles

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	√	√	√	√
Understand	√	√	√	√
Apply	√	√	√	√
Analyze	√	√	√	√
Evaluate	√	√	√	√
Create			√	
Total	15	15	10	60

Government College of Engineering, Karad
First Year B. Tech.
FE203: Basic Mechanical Engineering

Teaching Scheme		**Examination Scheme**	
Lectures	3 Hrs/week	**CT1**	15
Total Credits	3	**CT2**	15
		TA	10
		ESE	60

Course Objectives

1 Acquire basic knowledge of mechanical engineering
2 Understand principles of energy conversion system and power plants
3 Understand and identify power transmission devices with their functions
4 Learn and understand manufacturing process
5 Describe the scope of mechanical engineering in multidisciplinary industries

Course Content **Hours**

Unit I Thermodynamics

Heat, p-dV work and Internal Energy, Thermodynamic State, p-V representation of various thermodynamic processes and cycles, Thermodynamic System, First Law of Thermodynamics, PMM of first kind

Gas Laws, Gas Processes

Ideal gas equations, Properties at salient points, Air Standard efficiency (Numerical treatment on gas processes and Carnot, Otto cycles only) **7**

Unit II Introduction to IC Engine

Second Law of Thermodynamics – Statements, PMM of Second Kind, Two stroke, Four Stroke Cycles, Construction and Working of C.I. and S.I. Engines

Introduction to Refrigeration and Air Conditioning

Carnot Refrigerator, Vapour compression and vapour absorption system, Study of household refrigerator, window air conditioner (Descriptive Treatment only) **7**

Unit III Energy Sources

Current and energy scenario future (Global and Indian), supply and demand of energy, concept of kW-hr (1 unit energy) Renewable and non-renewable, solar collectors (flat and concentric) and photovoltaic cells, Wind, Geothermal, Wave, Tidal, Hydro power, Bio-gas, Bio-Diesel, (Descriptive Treatment Only) **7**

Unit IV Fluid Pumping and Turbo Machinery

Reciprocating pumps (single acting & double acting), reciprocating compressor, rotary compressors (lobe and vane) Types, Construction, working and applications, Turbine (Impulse & Reaction turbine) **7**

Unit V Mechanical Power Transmission

Machine elements: Axle, shaft, keys, pulleys, cams etc. Power transmission - belt drives, gear drives, chain drives, couplings, Applications of these devices, (Numerical treatment on Torque, speed, power for belt and gear drive only) Bearings :(Ball and roller bearing) **7**

Unit VI Manufacturing Processes

Material properties, tensile, compressive and shear strength, ductility, malleability, hardness, toughness, resilience, creep, thermal and electrical conductivity, etc.

Introduction to manufacturing processes - Casting process (Sand casting, die casting only) and metal joining processes (Arc welding, Gas welding, soldering and brazing)

7

Course Outcomes (CO):

After completion of **Basic Mechanical Engineering** the student will be able to

1. Understand principle of most of the mechanical devices and energy conversion system and power plants
2. Identify power transmission devices with their functions
3. Understand manufacturing process
4. Know properties of material and alloys

Text Books

1. R. Joel, Engineering Thermodynamics, The English Language Book Society.
2. R. K. Rajput, Thermal Engineering, Laxmi Publication, Delhi.
3. Achultan, Engineering Thermodynamics, Prentice Hall of India
4. P. K Nag "Thermodynamics", Tata McGraw-Hill Publishing Co. Ltd
5. V. Ganesan " Internal Combustion Engine" Tata McGraw-Hill Publishing Co. Ltd
6. Dr. S. P. Sukathame, Solar Energy, Tata Mc-Graw Hill Publication
7. G. D. Rai, Non-Conventional Sources of Energy, Khanna Publication
8. Arora and Domkunwar, Power Plant Engineering, DhanpatRai and Sons.
9. S. Rao and Dr. B. B. Parulekar - Energy Technology, Khanna Publication
10. R. K. Bansal "Fluid Mechanics & Hydraulic machines" Laxmi Publications
11. V. B. Bhandari "Design of Machine Elements" Tata McGraw-Hill Publishing Co. Ltd
12. R. S. Khurmi "Theory of Machines" S. Chand Publication
13. Elements of Mechanical Engineering, V. K. Maglik, PHI
14. Material Science &Engg. – A first course – V. Raghavan – PHI
15. V D Kodgire"Material Science And Metallurgy" Everest Publishers
16. S.K. HajaraChoudhury " Workshop Technology Vol I"Media Promoters and Publishers

References

1. Yunus A. Cengel and Boles, " Thermodynamics ",Tata McGraw-Hill Publishing Co. Ltd
2. Engineering Thermodynamics, Jones and Dugan, PHI, New Delhi
3. Fundamentals of Engineering Thermodynamics, E. Radhakrishnan, PHI, New Delhi
4. Mechanical Engineering Design, J. E. Shigley, MGH New York

Useful Links

1. nptel.ac.in
2. http://scribleindia.com/anna-university/wp-content/uploads/2013/06/BCM-notes.pdf
3. Cengel and Boles online book
4. http://efoundry.iitb.ac.in/Academy/index.jsp

Mapping of CO and PO

	a	b	c	d	e	f	g	h	i	j	k
CO1	✓					✓	✓	✓			
CO2	✓						✓	✓	✓	✓	
CO3	✓								✓	✓	✓
CO4	✓	✓			✓						✓

Assessment Pattern

Knowledge Level	**CT1**	**CT2**	**TA**	**ESE**
Remember	2	2		8
Understand	2	2		8
Apply	3	3		12
Analyse	3	3		12
Evaluate	2	2		8
Create	3	3		12
Total	15	15	10	60

Government College of Engineering Karad
First Year B. Tech
FE204: Basic Electrical Engineering

Teaching Scheme		**Examination Scheme**	
Lectures	3 Hrs/week	**CT1**	15
Total Credits	3	**CT2**	15
		TA	10
		ESE	60

Course Objectives

1 To make students aware of Solving simple ac and dc circuits.
2 To make students aware of Electric motor working and operation.
3 To make students aware of Domestic wiring and protective system.
4 To make students aware of Electrical System and Electrical appliances.

Course Contents

		Hours
Unit I	**D. C. Circuits**: Voltage and current sources, Kirchhoff's laws, mesh and node analysis, Energy conversion between electrical, mechanical, thermal quantities. Magnetic Circuit: Flux, flux density, Reluctance, field intensity, B-H curve, Series magnetic circuits.	6
Unit II	**Single phase AC Circuits:** Generation of single phase sinusoidal a. c. voltage ,R.M.S. and Average value ,form factor, peak factor, phasor representation of A.C. quantities, impedance ,admittance ,R-L,R-C,R-L-C series circuit, simple parallel circuit, power, power factor, power factor improvement by capacitor method.	6
Unit III	**Three phase A.C. Circuits** Introduction to 3 phase supply and its necessity, Generation of three phase A.C. voltage, balance three phase system, relation between line and phase quantities, power in three phase circuits	6
Unit IV	**Electrical Drives** Electrical Motor, Types of Motors. Single phase Induction motor: Working principle, operation and applications. Three phase Induction motor: working principle and operation of split phase motors.	6
Unit V	**Transformer** Single Phase Transformer: Construction, operating principle, Types, emf equation, voltage and current ratio, operation on no load and with load, power losses, efficiency, voltage regulation.	6
Unit VI	**Electrical Appliances**	

	Working principle and operation of Electric Iron, Geyser, Water heater, UPS, storage Batteries, BEE specifications. Electric Lamps: Incandescent Lamp, Fluorescent tube ,CFL, LED lamp Earthing: Necessity of Earthing, Earthing methods ,Fuse, MCB,ELCB, single line diagram of domestic wiring	6

Course Outcome (CO):

1 Student shall be able to analyse simple D.C. Circuits.
2 Student shall be able to understand A.C. fundamentals and apply the same for analysis of A.C. Circuits
3 Student shall be able to understand Ployphase fundamentals and apply the same for analysis of polyphase A.C. Circuits
4 Students will understand working principles of electric Motors
5 Students will understand working of Single phase transformer
6 Student shall be able to understand working of different home appliances.

Text Books

1 Basic Electrical Engineering D P Kothari, I J Nagrath Third Edition
2 Basic Electrical Engineering Dr. Debashish Jena Wiley India Press

References

1 Basic Electrical engineering by Lawrence P.Huelsman, Prentice Hall ,Inc. Englewood Cliffs. New Jersey (2009)
2 Basic Electrical engineering by A.E.Fitzgerald and Arvin Grabel, MC-Graw-Hill(2012)
3 Basic Electrical Engineering by Nagrath I.J. and D.P. Kothari ,Tata McGraw Hill (2010)
4 Electrical Engineering ,Vincent Del Toro, Prentice Hall ,Inc.EnglewoodCliffs,New Jersey (2011)
5 Basic Electrical Engineering by Allen Hambley, PHI India (2010)

Useful Links

1 www.freeengineeringbooks.com
2 www.indiabix.com/electrical-engineering/questions
3 www.electrical4u.com/objective-questions-electrical-engineering

Mapping of CO and PO

	a	b	c	d	e	f	g	h	i	j	k
CO1	√	√			√						
CO2				√		√		√	√		
CO3			√				√			√	√
CO4									√		√

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	2	4	0	8
Understand	4	4	4	16
Apply	4	2	2	12
Analyze	2	2	2	8

Evaluate	3	2	2	12
Create	0	1	0	4
Total	15	15	10	60

Government College of Engineering Karad
First Year B. Tech
FE205: Engineering Mechanics

Teaching Scheme		**Examination Scheme**	
Lectures	3 Hrs/week	**CT1**	15
Total Credits	3	**CT2**	15
		TA	10
		ESE	60

Course Objectives

1. To introduce student about basic mechanics and study of basic concepts of mechanics with its applications
2. To study statics including equilibrium of rigid bodies, friction, beams with different supports and loading
3. To study types of trusses, method of Analysis, method of Joints, method of section, Analysis of simple truss.
4. To study how to find out Centroid, Moment of inertia of plane and composite bodies
5. To study kinetics of linear motion, Work energy principal, De Alembert's principle
6. To study Impulse - momentum principle, Collision of elastic bodies

Course Contents

		Hours
Unit I	Basic concepts and fundamental laws, force, moment and couple, resolution and composition of force, system of forces, resultant, Varignon's theorem and law of moments.	7
Unit II	Lami's theorem, free body diagram, two force and three force members, Equilibrium of forces, equilibrium equations. Beams :Types of loads, types of supports, analysis of simple and compound beams, virtual work method for support reactions.	7
Unit III	Types of trusses, Assumption, Method of Analysis : Method of Joints, Method of section, Analysis of simple truss with max. 7 members	7
Unit IV	Centroid, moment of inertia 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.	7
Unit V	Kinematics of linear & circular motion, Kinetics of linear motion, Newton's Law, De Alembert's principle, work-energy principle, Impulse - momentum principle. Kinetics of circular motion	9
Unit VI	Collision of elastic bodies; direct central impact, oblique impact, coefficient of restitution, loss of kinetic energy.	5

Course Outcomes (CO):

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.
5 Understand basic concepts linear and rectilinear motion, Work energy principal, De-Alembert's principle
6 Understand basic concepts of kinetics of linear motion, , Impulse - momentum principle, Collision of elastic bodies

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 Textbook of Applied Mechanics",Ramamrutham. S,DhanpatRai Publications, 1987
5 Engineering Mechanics (Statics and Dynamics),Palanichamy, M. S., and Nagan, S.

References

1 Engineering Mechanics, R. K. Bansal and Sanjay Bansal, Jain Bros. Publishers, Delhi
2 Vector Mechanics for Engineers Vol.-I and II, F. P. Beer and E. R. Johnston, Tata Mc-Graw Hill Publication
3 Engineering Mechanics, Irving H. Shames, Prentice Hall of India, New Delhi
4 Engineering Mechanics, S. N. Saluja, SatyaPrakashan, New Delhi

Useful Links

1 NPTEL, www.nptel.ac.in
2 myEngineeringMechnics.com
3 www.sasi.ac.in/mech
4 http://www.schandpublishing.com
5 Study.com/directory/category/Engineeringmechanics

Mapping of CO and PO

	a	b	c	d	e	f	g	h	i	j	k
CO1	√				√	√					
CO2			√								√
CO3		√				√					
CO4					√				√		√
CO5			√				√	√			
CO6											

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	3	3	1	12

Understand	3	3	2	12
Apply	2	2	2	8
Analyze	2	2	2	8
Evaluate	2	2	2	8
Create	3	3	1	12
Total	15	15	10	60

Government College of Engineering Karad
First Year B. Tech
FE206 Engineering Chemistry Lab

Laboratory Scheme		**Examination Scheme**	
Practical	2 Hrs/week	**CA**	50
Total Credits	1		

Course Objectives

1. Practically handling of different chemicals and glassware's
2. Technical needs of potable water for domestic and industrial use
3. Preparation of polymers
4. Handling of different instruments

Course Contents

Experiment 1 Determination of total hardness of water
Objective: Students should be able to understand limit of hardness of water for domestic and industrial purposes

Experiment 2 Determination of calcium from limestone
Objective: Students should be able to understand how much calcium present in limestone ore

Experiment 3 Determination of Mg from Dolomite
Objective: Students should be able to understand how much Mg present in dolomite ore

Experiment 4 Determination of chlorine from water
Objective: Limit of chlorine in water used for drinking purposes

Experiment 5 Preparation of urea formaldehyde
Objective: Preparation of polymer (advanced material)

Experiment 6 Preparation of phenol formaldehyde.
Objective: Preparation of polymer (advanced material)

Experiment 7 Determination of acidity of water
Objective: Effect of acidic water on living and non-living things

Experiment 8 Determination of alkalinity of water
Objective: Effect of alkaline water on living and non-living things

Experiment 9 Verification of Lambert's-Beer's law
Objective: students should know whether law practically applicable or not

Experiment 10 Determination of pH of solution
Objective: To know different types of solutions on pH

List of Submission

1. Total number of Experiments - 10

Course Outcomes (CO):

1. To be able to know difference between potable water and non-potable water
2. To be able to know preparation of polymers
3. To be able to know working of instruments
4. To be able to know what we studied theoretically whether it right or wrong practically

Mapping of CO and PO

	a	B	c	d	e	f	g	h	i	j	k
CO1	√										
CO2		√									
CO3			√								
CO4				√							

Assessment Pattern

Skill Level	Exp 1	Exp 2	Exp 3	Exp 4	Exp 5	Exp 6	Exp 7	Exp 8	Exp 9	Exp 10	CA
Assembling	√	√	√	√	√	√	√	√		√	
Testing	√	√	√	√	√	√	√	√		√	
Observing	√	√	√	√	√	√	√	√	√	√	
Analyzing	√	√	√	√	√	√	√	√	√	√	
Interpreting	√	√	√	√	√	√	√	√		√	
Designing											
Creating											
Deducing conclusions	√	√	√	√	√	√	√	√	√	√	

Government College of Engineering, Karad
First Year B. Tech.
FE207: Basic Mechanical Engineering Lab

Laboratory Scheme		**Examination Scheme**	
Practical	2 Hrs/week	**CA**	50
		Total Credits	1

Course Objectives

1 Acquire basic knowledge of mechanical engineering
2 Understand principles of energy conversion system and power plants
3 Understand and identify power transmission devices with their functions
4 Learn and understand manufacturing process

Course Contents

Experiment 1 Demonstration of Two stroke and four stroke engine with the help of models
Experiment 2 Demonstration of vapour compression refrigeration system, window air conditioner and split air conditioner
Experiment 3 Demonstration of solar water heating system
Experiment 4 Industrial visit to hydroelectric power plant
Experiment 5 Industrial visit to steam power plant
Experiment 6 Industrial visit to Diesel power plant
Experiment 7 Demonstration of clutch, brakes and jack and estimation of velocity ratio and Gear ratio
Experiment 8 Demonstration of pumps and compressor
Experiment 9 Demonstration of I.C. engine
Experiment 10 Demonstration of material properties such as tensile strength, compressive strength, toughness, resilience, ductility, hardness, etc.

Any 8 experiments from the above can be performed.

List of Submission

1 Total number of experiments 08

Course Outcome(CO):

After completion of **Basic Mechanical Engineering Lab** the student will be able to
1 Identify power transmission devices with their functions
2 Estimate the velocity ratio and gear ratio
3 understand manufacturing process
4 Know various properties of metals and alloys and testing of the materials.

Mapping of CO and PO

	a	b	c	d	e	f	g	h	i	j	k
CO1	✓			✓	✓	✓		✓	✓	✓	✓
CO2	✓	✓		✓	✓						✓
CO3	✓						✓	✓	✓	✓	
CO4	✓	✓			✓		✓			✓	✓

Assessment Pattern

Skill Level	**Exp1**	**Exp2**	**Exp3**	**Exp4**	**Exp5**	**Exp6**	**Exp7**	**Exp8**	**Exp9**	**Exp10**	**CA**
Assembling											
Testing										✓	10
Observing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Analysing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Interpreting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Designing											
Creating											
Deducing Conclusions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10

Government College of Engineering Karad
First Year B. Tech
FE208: Basic Electrical Engineering Lab

Laboratory Scheme | **Examination Scheme**
Practical 2 Hrs/week | **CA** 50
Total Credits 1

Course Objectives

1 To make students aware of ac and dc waveforms
2 To make students aware of solving numerical related to simple electrical networks and a.c. circuits.
3 To make students aware of calculation of regulation and efficiency of single phase transformer.
4 To make students understand working and applications of various electrical lamps.
5 Student will be aware of various electrical safety measures.

Course Contents

Experiment 1 Observation of ac and dc voltage and current waveform on CRO.
Experiment 2 Verification of Kirchhoff's Voltage Law and Kirchhoff's Current law.
Experiment 3 R-L series circuit: Calculation of current, voltage and verification.
Experiment 4 R-C series circuit: Calculation of current and voltage and verification
Experiment 5 R-L-C series circuit: Calculation of current and voltage and verification of series resonance.
Experiment 6 Determination of efficiency and regulation by Load test on single phase transformer.
Experiment 7 Measurement of electrical parameters of appliances.
Experiment 8 Introduction to domestic wiring, service mains, meter board and distribution board, Use of Fuse and Miniature Circuit Breaker.
Experiment 9 Introduction to various renewable energy sources.
Experiment 10 Study of different luminaries including fluorescent tube, CFL, LED lamps.
Experiment 11 Introduction to electrical safety.

List of Submission

1 Minimum 8 experiments to be performed and evaluated in journal

Course Outcomes (CO):

1 Student will understand to solve simple dc and ac circuits.
2 Student will understand concept and calculation of regulation and efficiency of single phase transformer.
3 Student will understand use of various electrical appliances and lamps.
4 Student will be aware of various electrical safety measures.

Mapping of CO and PO

	a	B	c	d	e	f	g	h	i	j	k
CO1	√	√							√		√
CO2			√	√							
CO3					√	√		√			
CO4			√				√			√	√

Assessment Pattern

Skill Level	Exp 1	Exp 2	Exp 3	Exp 4	Exp 5	Exp 6	Exp 7	Exp 8	Exp9	Exp10	Exp11	CA
Assembling		√	√	√	√	√	√	√				
Testing						√		√			√	
Observing	√	√	√	√	√	√	√	√	√	√	√	
Analyzing	√	√	√	√	√	√	√			√		
Interpreting		√	√	√	√	√	√		√		√	
Designing		√				√	√					
Creating			√	√	√	√	√	√			√	
Deducing conclusions		√	√	√	√	√	√	√	√	√	√	

Government College of Engineering Karad
First Year B. Tech
FE209: Engineering Mechanics Lab

Laboratory Scheme		**Examination Scheme**	
Practical	2 Hrs/week	**CA**	50
Total Credits	1		

Course Objectives

1. Study basic concepts and fundamental laws, force, moment and couple
2. Study of resolution and composition of force, system of forces, resultant
3. Study Varignon's theorem and law of moments, Lami's theorem, free body diagram
4. Analysis of simple and compound beams, virtual work method for support reactions
5. Study the moment of inertia of a Flywheel.
6. Study of simple lifting machine using screw jack.
7. Study of differential wheel and axle.
8. Study the coefficient of restitution for a given pair of materials.

Course Contents

Experiment 1 To verify the polygon Law forces.
Objective: Study basic concepts and fundamental laws, force, moment and couple.

Experiment 2 To understand the nature of forces in the members of jib crane.
Objective: Study resolution and composition of force, system of forces, resultant

Experiment 3 To verify law of moments using Bell crank lever
Objective: Study Varignon's theorem and law of moments, Lami's theorem, and free body diagram.

Experiment 4 To determine the reaction for simply supported beam.
Objective: Analysis of simple and compound beams, virtual work method for support reactions

Experiment 5 To determine mass moment of inertia of Flywheel.
Objective: To determine Moment of inertia of a Flywheel.

Experiment 6 To calculate the efficiency of simple screw jack.
Objective: Study of simple lifting machine using screw jack.

Experiment 7 To determine the mechanical advantages, velocity ratio &efficiency of a differential wheel and axle.
Objective: Study of differential wheel and axle.

Experiment 8 To determine the coefficient of restitution for different materials.
Objective: To determine the coefficient of restitution for a given pair of materials.

Drawing Sheet No.1 To find resultant - 3 problems

Drawing Sheet No.2 To find support reactions - 3 problems

List of Submission

1. Total number of Experiments – 8
2. Total number of sheets – 2

Course Outcomes (CO):

1. Understand basic concepts of mechanics and fundamental laws, force, moment and couple.
2. Understand the variation in magnitude of forces in the members of a jib crane.

3 Understand Varignon's theorem and law of moments, Lami's theorem, free body diagram.
4 Understand simple and compound beams, virtual work method for support reactions.
5 Understand study of how to calculate mass M.I. practically.
6 Understand of behaviour of simple screw jack.
7 Understand mechanical advantages, velocity ration & efficiency of a differential wheel and axle.
8 Understand the coefficient of restitution for a given pair of materials.

Assessment Pattern

Skill Level	Exp 1	Exp 2	Exp 3	Exp 4	Exp 5	Exp 6	Exp 7	Exp 8	Drawing Sheets
Assembling	√	√	√	√	√	√	√	√	√
Testing		√	√		√	√	√	√	
Observing	√	√	√	√	√		√	√	√
Analyzing	√	√	√	√	√	√	√	√	√
Interpreting	√		√	√	√	√			
Designing			√	√		√	√	√	√
Creating	√			√		√	√	√	√
Deducing conclusions	√	√	√	√	√	√	√	√	√

Government College of Engineering Karad
First Year B. Tech
FE210: General Proficiency - I

Laboratory Scheme		**Examination Scheme**	
Theory	2 Hrs/week	**CA**	50
Practical	2 Hrs/week	**Total Credits**	3

Course Objectives

1. To produce various genre of oral and written discourses.
2. To confidently & effectively communicate
3. To develop positive thoughts, positive language & positive expression leading to holistic outlook towards life

Course Contents

Unit I **Description:** The module description is transacted based on the theme Fashion and style. There are five modules under this topic. Each module has a specific outcome. Each module is dealt with the help of a linguistic tool that is interaction

Module 1 **Duration: 3 hrs**

Objective: To produce speech

A trigger (picture/Image/video/ Audio/ Script) is used to initiate interaction through this the class arrives at a common theme. Groups in the class produce speech on this common theme.

Module 2 **Duration: 3 hrs**

Objective: Reading a biographical sketch

Based on the trigger (picture/Image/video/ Audio/ Script) related to the theme a text is given to process reading. The text given here is a biographical sketch. Through this learners understand the features of biographical sketch, learn to read a text critically & track their own reading process. At the end of this process the learners come out with graphical organizers and there by construct multiple texts out of it.

Module 3 **Duration: 3 hrs**

Objective: Writing a description

This module focuses on describing an event. The learners understand how to organize their ideas while writing a description. Develop insight into well formed expressions and finally edit their own description by identifying different errors (Morphological, Syntactic, Word order, punctuation etc)

Module 4 **Duration: 3 hrs**

Objective: Reading a news report.

Based on the trigger (picture/Image/video/ Audio/ Script) related to the theme a text is given to process reading. The text given here is a news report. Through this learners

understand the features of news report , learn to read a text critically & track their own reading process. At the end of this process the learners come out with graphical organizers and there by construct multiple texts out of it.

Module 5 **Duration: 3 hrs**

Objective: Writing a Narrative

This module focuses on understanding the features of a narrative. The learners understand how to organize their ideas while writing a narrative. Develop insight into well formed expressions and finally edit their own narrative by identifying different errors (Morphological, Syntactic, Word order, punctuation etc)

Unit II Conversation:

The domain conversation is transacted based on the theme Love and Romance. There are five modules under this domain. Each module has a specific outcome. Each module is dealt with the help of a linguistic tool that is interaction

Module 1 **Duration: 3 hrs**

Objective: To produce debate

A trigger (picture/Image/video/ Audio/ Script) is used to initiate interaction through this the class arrives at a common theme. A debatable preposition is brought out on the common theme. The class debates by understanding the features of a debate.

Module 2 **Duration: 3 hrs**

Objective: Reading a description

Based on the trigger (picture/Image/video/ Audio/ Script) related to the theme a text is given to process reading. The text given here is a description. Through this learners understand how to read a text effectively & understand the sensory perceptions and emotions involved. At the end of this process the learners come out with graphical organizers and there by construct multiple texts out of it.

Module 3 **Duration: 3 hrs**

Objective: Writing a Conversation

Based on the trigger (picture/Image/video/ Audio/ Script) conversation is evolved through interaction among the characters seen in the trigger. The features of conversation are highlighted. The learners understand how to organize their ideas while writing a conversation. Develop insight into well formed expressions and finally edit their own conversation by identifying different errors (Morphological, Syntactic, Word order, punctuation etc)

Module 4 **Duration: 3 hrs**

Objective: Reading an article.

Based on the trigger (picture/Image/video/ Audio/ Script) related to the theme a text is given to process reading. The text given here is a news an article. Through this learners understand the features of article, learn to read a text critically & track their own reading process. At the end of this process the learners come out with graphical organizers and there by construct multiple texts out of it.

Module 5 **Duration: 3 hrs**

Objective: Writing a Narrative

This module focuses on understanding the features of a narrative. The learners understand how to organize their ideas while writing a narrative. Develop insight into well formed expressions and finally edit their own narrative by identifying different errors (Morphological, Syntactic, Word order, punctuation etc)

Unit III **Narrative:**

The domain narrative is transacted based on the theme Love and Entertainment. There are five modules under this domain . Each module has a specific outcome. Each module is dealt with the help of a linguistic tool that is interaction.

Module 1 **Duration: 3 hrs**

Objective: To produce speech

A trigger (picture/Image/video/ Audio/ Script) is used to initiate interaction through this the class arrives at a common theme. Groups in the class produce a short speech on this common theme by understanding the features of speech.

Module 2 **Duration: 3 hrs**

Objective: Reading a Narrative

Based on the trigger (picture/Image/video/ Audio/ Script) related to the theme a text is given to process reading. The text given here is a narrative. Through this learners understand how to read a text effectively & understand the sensory perceptions and emotions involved. At the end of this process the learners come out with graphical organizers and there by construct multiple texts out of it.

Module 3 **Duration: 3 hrs**

Objective: Writing a Narrative in groups

A narrative is evolved based on the events that has occurred in the trigger (picture/Image/video/ Audio/ Script). The features of writing a narrative are highlighted. The learners understand how to organize their ideas while writing a narrative in groups. Develop insight into well formed expressions and finally edit group narratives by identifying different errors (Morphological, Syntactic, Word order, punctuation etc)

Module 4 **Duration: 3 hrs**

Objective: To produce discussion

A trigger (picture/Image/video/ Audio/ Script) is used to initiate interaction through this the class arrives at a line of discussion. The groups discuss on the line of discussion and present their views to the class.

Module 5 **Duration: 3 hrs**

Objective: Writing a Narrative individually

This module focuses on understanding the features of a narrative. The learners understand how to organize their ideas while writing a narrative. Develop insight into well formed expressions and finally edit their own narrative by identifying different errors (Morphological, Syntactic, Word order, punctuation etc)

Unit IV **Attitude building**

The domain attitude is transacted based on the theme curriculum vitae. There are five modules under this domain . Each module has a specific outcome. Each module is dealt with the help of a linguistic tool that is interaction

Module 1 **Duration: 3 hrs**

Objective: To produce speech

A trigger (picture/Image/video/ Audio/ Script) is used to initiate interaction through this the class arrives at a common theme. Groups in the class produce a short speech on this common theme by understanding the features of speech.

Module 2 **Duration: 3 hrs**

Objective: Reading a biography

Based on the trigger (picture/Image/video/ Audio/ Script) related to the theme a text is given on “Attitude is Altitude” to process reading. Through this learners understand how to read a text effectively & understand the sensory perceptions and emotions involved. At the end of this process the learners come out with graphical organizers and there by construct multiple texts out of it.

Module 3 **Duration: 3 hrs**

Objective: Writing an essay

Based on the trigger (picture/Image/video/ Audio/ Script)the learners are asked to write an essay on “Is disability the state of mind”. The features of writing an essay are highlighted. The learners understand how to organize their ideas while writing an essay in groups. Develop insight into well formed expressions and finally edit group it by identifying different errors (Morphological, Syntactic, Word order, punctuation etc)

Module 4 **Duration: 3 hrs**

Objective: To produce speech

A trigger (picture/Image/video/ Audio/ Script) is used to initiate interaction through this the class arrives at a common theme. Groups in the class produce a short speech on "Turning their limitations into strengths" by understanding the features of speech.

Module 5 **Duration: 3 hrs**

Objective: To present their curriculum vitae'
A trigger (picture/Image/video/ Audio/ Script) is used to initiate interaction the class arrives at writing their comprehensive CV. They make a convincing presentation on their CV.

Course Outcomes (CO):
After completing this course students will be able:

1. To produce various genres of discourses such as conversations, descriptions, narratives, reports, essays, letters, biographical sketches, news reports, etc. both orally and in writing.
2. To participate in debates, discussions, seminars and speak effectively, fluently and forcefully
3. To read critically different genres of written English
4. To understand the differences between positive and negative attitude
5. To learn scientific methods of developing positive attitude towards self & others
6. To develop positive thoughts, positive language and positive expressions

Mapping of CO and PO

	a	b	c	d	e	f	g	h	i	j	k
CO1											
CO2											
CO3											
CO4											
CO5											
CO6											

Government College of Engineering, Karad
First Year B. Tech.
FE211: Workshop Practice II

Laboratory Scheme		**Examination Scheme**	
Practical	2 Hrs/week	**CA**	50
Total Credits	1		

Course Objectives

1. To develop hands-on skills, workmanship and workshop practices
2. To learn about Components of computer, its peripherals and networking
3. Use of electrical/electronic equipment such as multi-meter, LCR meter, Oscilloscope, soldering iron, breadboard, circuit components, etc.
4. Reading and preparing simple drawings / sketches
5. Using various measurement and marking tools

Course Contents

		Hour
Experiment 1	**Welding:** Concept of accidents causes of accidents, safety precautions while working in shop, safety equipments and their use. **Welding:** One job on Arc welding- Lap / Butt / Tee Joint etc. (For individual student) and demonstration of welding processes – Arc, Gas, Spot, etc. OR Table, Shoe stand, Bag stand etc. (For 4-6 students)	2
Experiment 2	**Carpentry:** Brief introduction to instruments like – Steel rule, Calipers, Vernier Caliper, Micrometer, Dial Gauge, Vernier height Gauge etc. Least counts, common errors and care while using them, Use of marking gauge, 'V' block and surface plate. **Carpentry:** One composite job involving dovetail joint, T joint, cross halving joint, pen stand etc. (For individual student) OR Table, Teapot, Stool etc. (For 4-6 students)	2
Experiment 3	**Sheet metal:** Introduction to smithy operations like- bending, forming, upsetting, drawing. Smithy tools, hammer, hot & cold chisel flatters, tongs, anvil etc. **Sheet metal Work:** Sheet metal working involving marking, cutting, bending, joining operations such as a tray bin, funnel, etc. One job on commercial items such as Dust bin, funnel, tray etc.	2
Experiment 4	**Air pollution:** Air pollution due to automobiles, causes, PUC testing. **Plumbing:** Demonstration on plumbing tools, pipes, fitments, valves, etc.	1
Experiment 5	**Computer:** Introduction and identification of hardware components of a typical computer system. Assembling and Disassembling the PC.	1
Experiment 6	Handling and operating peripheral devices like printer, scanner, pen drives, CD-ROM, Multimedia Devices, UPS etc.	2
Experiment 7	Identification and study of communication elements like Single pair wires (phone lines), multi-pair wires (UTP), fibre-optic cables, printer data cables, connectors- RJ-45, RJ-9, RJ-11, USB, 9-Pin and 25-Pin serial and parallel connectors; converters- serial to USB, 9-Pin to 25-Pin, Vice-Versa and others.	2
Experiment 8	Troubleshooting and Maintenance of PC	2