Government College of Engineering, Karad

SCHEME OF INSTRUCTION & SYLLABI

Programme : ALL (Physics group)

Scheme of Instruction for First Year of B. Tech. (UG) Degree in all Programmes

Semester – I

Mandatory 03-week Induction Program in the first semester for every student.

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Credits	EXAM SCHEME				
									CT1	CT2	TA/CA	ESE	TOTAL
1	BSC	FE1101	Mathematics – I	3	1	-	4	4	15	15	10	60	100
2	BSC	FE1102	Physics	3	1	-	4	4	15	15	10	60	100
3	ESC	FE1103	Programming for Problem Solving	3	-	-	3	3	15	15	10	60	100
4	ESC	FE1104	Engineering Graphics and Design	1	-	-	1	1	-	-	50	-	50
5	BSC	FE1105	Physics Lab	-	-	2	2	1	-	-	25	25	50
6	ESC	FE1106	Programming for Problem Solving Lab	-	-	4	4	2	-	-	50	50	100
7	ESC	FE1107	Engineering Graphics and Design Lab	-	-	4	4	2	-	-	50	50	100
			Total	**10**	**02**	**10**	**22**	**17**	**45**	**45**	**205**	**305**	**600**

L- Lecture T-Tutorial P-Practical

CT1- Class Test 1 TA/CA- Teacher Assessment/Continuous Assessment

CT2- Class Test 2 ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	HSMC (Hum., So. Sc, Mgmt.)	BSC (Basic Sc.)	ESC (Engg. Sc.)	PCC (Programme Core courses)	PEC (Programme Elective courses)	OEC (Open Elective courses)	MCC (Mandatory Courses)	Project / Seminar / Industrial Training
Credits	--	9	8	--	--	--	--	--
Cumulative Sum	--	9	8	--	--	--	--	--

TOTAL CREDITS=17

Government College of Engineering, Karad
SCHEME OF INSTRUCTION & SYLLABI
Programme: (Chemistry group)
Scheme of Instruction for First Year of B. Tech. (UG) Degree in all Programmes Semester – I

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Credits	EXAM SCHEME				
									CT1	CT2	TA/CA	ESE	TOTAL
1	BSC	FE1201	Mathematics – II	3	1	-	4	4	15	15	10	60	100
2	BSC	FE1202	Chemistry	3	1	-	4	4	15	15	10	60	100
3	ESC	FE1203	Engineering Mechanics	3	1	-	4	4	15	15	10	60	100
4	HSMC	FE1204	Professional Communication	2	-	-	2	2	15	15	10	60	100
5	BSC	FE1205	Chemistry – I Lab	-	-	2	2	1	-	-	25	25	50
6	ESC	FE1206	Engineering Mechanics Lab	-	-	2	2	1	-	-	50	50	100
7	ESC	FE1207	Workshop Manufacturing Practices	-	-	4	4	2	-	-	50	50	100
9	HMSC	FE1208	Professional Communication Lab	-	-	2	2	1	-	-	25	25	50
10	ESC	FE1209	Basic Engineering	3	-	-	3	1	-	-	-	50	50
			Total	**14**	**03**	**10**	**27**	**20**	**60**	**60**	**190**	**440**	**750**

L- Lecture T-Tutorial P-Practical
CT1- Class Test 1 TA/CA- Teacher Assessment/Continuous Assessment CT2- Class Test 2 ESE- End

Course Category	HSMC (Hum., So. Sc, Mgmt.)	BSC (Basic Sc.)	ESC (Engg. Sc.)	PCC (Programme Core courses)	PEC (Programme Elective courses)	OEC (Open Elective courses)	MCC (Mandatory Courses)	Project / Seminar / Industrial Training
Credits	03	09	08	--	--	--	--	--
Cumulative Sum	03	18	16	--	--	--	--	--

Semester Examination (For Laboratory End Semester performance) TOTAL CREDITS=17+20=37

Government College of Engineering, Karad

First Year B. Tech

FE1101: Engineering Mathematics-I

Teaching Scheme			Examination Scheme	
Lectures	03 Hrs/week		CT – 1	15
Tutorials	01 Hrs/week		CT – 2	15
Total Credits	04		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

1.	To apply differential and integral calculus. Apart from some other applications they will have a basic understanding of Beta and Gamma functions
2.	To apply Rolle's Theorem that is fundamental to application of analysis to Engineering problems
3.	To apply the Fourier series for learning advanced Engineering Mathematics
4.	To deal with functions of several variables those are essential in most branches of Engineering. To learn the essential tool of matrices and linear algebra in a comprehensive manner

	Course Contents	Hours
Unit 1	**Matrices:** Introduction to rank of a matrix; System of linear equations; Symmetric, Skew symmetric and Orthogonal matrices; Eigen values and Eigenvectors, Cayley-Hamilton Theorem, Diagonalization of matrices.	**(7)**
Unit 2	**Differential and Integral Calculus:** Rolle's Theorem, Mean value theorem, Taylor's and Maclaurin's theorem with remainders; Gamma function, Beta function and its properties	**(6)**
Unit 3	**Partial Differentiation:** Partial derivatives, Homogeneous functions and Euler's theorem, Composite function, total derivative; Method of Lagrange's multipliers, Errors and Approximations	**(6)**
Unit 4	**Fourier series:** Fourier series in the range $(0, 2l)$ ***and*** $(-l, l)$ where l is arbitrary, Dirichelet's conditions, Fourier Series for Even and Odd function, Half range sine and cosine series in the range $(0, l)$ where l is arbitrary, Parseval's identity	**(4)**
Unit 5	**Vector Calculus:** Scalar and vector point functions, Gradient of scalar point function, Directional Derivatives, Curl and Divergence of vector point functions. Solenoidal and irrotational force fields	**(7)**
Unit 6	**Complex Number:** Circular functions, Hyperbolic and Inverse Hyperbolic functions, logarithms of complex number, separation into real and imaginary parts of a complex number	**(6)**
Tutorials		**(12)**

Text Books

1.	H.K.DAS "Advance Engineering Mathematics" S. Chand publications
2.	Debashis Datta "Textbook of Engineering Mathematics'' New Age International Publication
3.	"Engineering Mathematics A Tutorial Approach". Ravish R..Singh, Mukul Bhatt.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.	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, 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															
CO 2															
CO 3															
CO 4															

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	√	√	√	√
Understand	√	√	√	√
Apply	√	√	√	√
Analyse	√	√	√	√
Evaluate	√	√	√	√
Create			√	
TOTAL	15	15	10	60

Government College of Engineering, Karad

First Year B. Tech

FE1102: Engineering Physics

Teaching Scheme			Examination Scheme	
Lectures	03 Hrs/week		CT – 1	15
Tutorials	01 Hrs/week		CT – 2	15
Total Credits	04		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

1.	To Analyze Crystal Structure and understand basics of Quantum Physics for Engineering.
2.	To understand Wave Optics, LASER and Sound for application in Engineering Technology.
3.	To build a foundation of Superconductivity and Nuclear Energy
4.	To implement the preface of Nano and its recent need in Engineering Technology.

	Course Contents	Hours
Unit 1	***Crystallography:*** Introduction (Lattice point, Space lattice, Basis, Crystalline solid), Unit cell- Primitive and non-primitive, Bravais Lattice, Seven crystal systems (Interfacial angle, axial length Bravais Lattice and examples with diagram), properties of unit cell, Centre of symmetry, plane of symmetry, Axis of symmetry Symmetry elements of cube, relation between density and lattice constant, Miller indices and sketches for different planes, Laue Method, Bragg's law and Bragg's Spectrometer, X-ray diffraction by powder method, Problems	**(7)**
Unit 2	***Quantum Physics*** Introduction to Quantum mechanics, Plank's Quantum Theory, Photoelectric Effect, Compton Effect with theory, Wave Particles Duality, Matter waves, Properties of Matter wave, Heisenberg Uncertainty principle for position and momentum of particle, Problems.	**(6)**
Unit 3	***Wave optics and sound:*** Interference of light, Young's double slit experiment, Newton's rings. Farunhofer diffraction from a single slit, Rayleigh criterion; Diffraction gratings and its theory and their resolving power, Polarization, optical activity, Lorentz Half shade Polarimeter, Problems, Ultrasonic waves, Magnetostriction oscillator and Piezoelectric Oscillator, Applications	**(6)**
Unit 4	***LASER:*** Introduction, Absorption, Spontaneous Emission, Stimulated Emission, Population Inversion, Solid-state lasers (ruby), Properties of laser beams: applications of lasers in science, engineering and medicine, Holography.	**(4)**
Unit 5	***Superconductivity and Nuclear energy*** Introduction, Property of superconductor, Meissner Effect, Type I and Type II superconductor, Josephsons Effect, Applications, Nuclear Energy, Fusion (P-P chain and C-N Cycle), Fission,Chain Reaction, Nuclear Fission Reactor, Numerical Problems.	**(7)**
Unit 6	***Nano science and Nano technology*** Introduction(nano material, nano science, nano technology), Significance of Nanoscale and properties, techniques for production of nano materials (Physical and chemical methods), Characterization- scanning tunneling microscopy and Atomic force microscopy, Application of nano technology, Carbon Nanotube	**(6)**
Tutorials		**(12)**

Text Books

1.	V. Rajendran– Engineering Physics- Mc. Graw Hills
2.	Vijaya kumari- Engineering Physics-Vikas publication
3.	B. K. Pandey and S. Chaturvedi- Engineering Physics, Cengage Learning-2012

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.(8^{th} Edtion).
3.	Alan Giambattista and others- Fundamentals of physics, Tata Mc. Graw Hills

4.	Resnick Halliday, Physics Volume-I, Krane -John Wiley & Sons Pub.
5.	B. L. Theraja -Modern Physics - S. Chand & Company Ltd., Delhi.
6.	R. K. Gaur & Gupta S. L, Engineering Physics -Dhanapat Rai Publication.
7.	Sanjay D Jain, Girish G. Sahasrabuddhe - Engineering Physics, Universities Press
8.	LASERS Theory and Applications – K. Thyagarajan, A. K. Ghatak; Macmillan India Limited.
9.	Quantum Mechanics – L. J. Schiff; Mc-Graw Hill International Edition.
10.	A Text Book of Optics – N. Subramanyam & Brijlal; (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 ↓	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															
CO 2															
CO 3															
CO 4															

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	√	√	√	√
Understand	√	√	√	√
Apply	√	√	√	√
Analyse	√	√	√	√
Evaluate	√	√	√	√
Create			√	
TOTAL	15	15	10	60

Government College of Engineering, Karad

First Year B. Tech

FE1103: Programming for Problem Solving

Teaching Scheme			Examination Scheme	
Lectures	03 Hrs/week		CT – 1	15
Tutorials	00 Hrs/week		CT – 2	15
Total Credits	03		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

1.	Students will able to do an algorithm for solving problems.
2.	To test and execute the programs and correct syntax and logical errors.
3.	Students will able to implement the concepts of function arrays and string.
4.	Students will able to apply the concepts of structure and pointers

	Course Contents	Hours
Unit 1	**Introduction to Programming-** Introduction to components of a computer system. Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/Pseudocode with examples	**(7)**
Unit 2	**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, Storage classes, 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,	**(6)**
Unit 3	**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. Recursion, Declaring and initialing string variables, reading string from terminal, writing string to screen, string handling functions. Passing array and string to function	**(6)**
Unit 4	**Structure-** Defining and declaring structure, accessing structure members, structure initialization, array of structures, nesting of structure structures and functions, union and enumeration	**(4)**
Unit 5	**Pointer-** Defining and declaring pointers, accessing the address space of a variable, declaring and initialization pointer variables, accessing a variable through its pointer, pointer as a function argument, pointer expressions, pointers to arrays, strings and structure, self-referential structures example of linked list, Dynamic memory allocation	**(7)**
Unit 6	**File Handling-** File Operations, Character I/O, String I/O, Formatted I/O, Block I/O, Random File Operations	**(6)**
Tutorials		**(12)**

Text Books

1.	Programming in ANSI C 6th edition by E. Balguruswami – Tata McGraw Hill
2.	Let us C by Yashvant Kanetkar- BPB publications
3.	

Reference Books

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

Useful Links

1.	http://cse02-iiith.vlabs.ac.in/
2.	http://nptel.ac.in/courses/106106127

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															
CO 2															
CO 3															
CO 4															

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	√	√	√	√
Understand	√	√	√	√
Apply	√	√	√	√
Analyse	√	√	√	√
Evaluate	√	√	√	√
Create			√	
TOTAL	15	15	10	60

Government College of Engineering, Karad

First Year B. Tech.

FE 1104: Engineering Graphics & Design

Teaching Scheme			Examination Scheme	
Lectures	01 Hrs/week		CA/TA	50
Total Credits	01			

Course Outcomes (CO)

At the end of course

1.	Students will be able to understand the use engineering drawing skills as a means of accurately and clearly communicating ideas, information and instructions in different engineering disciplines. (Blooms Level 1 & 2)
2.	Students will be able to demonstrate the use of different types of drawing instruments, use of symbols and conventions in engineering drawing (Blooms level 3)
3.	Students will be able to draw projections of lines, different types of planes, Solids, Orthographic, Isometric projections of simple objects. (Blooms cognitive level 2 & 3)
4.	Students will acquire requisite lifelong knowledge, techniques and attitude required for advanced study of engineering drawing (Blooms cognitive level 3)

Detailed contents

Traditional Engineering Graphics:
Principles of Engineering Graphics; Orthographic Projection; Descriptive Geometry; Drawing Principles; Isometric Projection; Perspective; Reading a Drawing; True Length, Angle; Section of solids.

Total of 10 Lecture Hours & 60 Hours of Lab
(Except the basic essential concepts, most of the teaching part can happen concurrently in the laboratory)

	Course Contents	Hours
Unit 1	***Introduction to Engineering Drawing Covering*** Principles of Engineering Graphics and their significance, usage of Drawing instruments, lettering, Conic sections (using General focus-directrix method only); Cycloid (excluding Epicycloid, Hypocycloid) and Involute;	**(02)**
Unit 2	***Orthographic Projections Covering, Points & Lines*** Principles of Orthographic Projections-Conventions; Projections of Points and lines inclined to both planes (line in first quadrant only, Traces theory only);	**(02)**
Unit 3	***Projections of Regular Planes Covering,*** Projections of inclined Planes resting on HP only; (Auxiliary planes theoretical only) (excluding freely suspended planes)	**(02)**
Unit 4	***Projections of Regular Solids Covering,*** Projection of Prisms, Pyramids, and cylinder inclined to both reference planes, solids in first quadrant and resting on HP only. (Excluding frustum, tetrahedron and sphere) (excluding freely suspended solids)	**(02)**
Unit 5	***Projections of Regular Sectional Solids Covering,*** Sections and Sectional Views of Right Angular Solids covering, Prism, Cylinder, Pyramid, Cone – Auxiliary Views;	**(02)**
Unit 6	***Isometric Projections Covering*** Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa for simple solids only;	**(02)**

CA/TA will be based on Successful submission of Drawing sheets as per listed below

Sheet No 1:	Engineering Curves
Sheet No 2:	Projections of Points & Lines
Sheet No 3:	Projections of Planes
Sheet No 4:	Projections of Solids
Sheet No 5:	Projections of Section of Solids
Sheet No 6:	Isometric Projections of Simple solids
Sheet No 7:	Orthographic Projection of Simple components (optional)

Text Books

1.	Bhatt N.D., Panchal V.M. & Ingle P.R., (2018), Engineering Drawing, Charotar Publishing House
2.	Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education

3.	Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication
4.	Dhananjay A Jolhe, Engineering Drawing with an introduction to AutoCAD, TMH Publication
5.	P. S. Gill, Engineering Drawing, S. K. Katariya & sons Publication
Reference Books	
1.	Cencil Jenson, Jay D. Helsel, D. R. Short, Engineering Drawing & Design, TMH Pub
2.	M. L. Dabhade, Engineering Graphics, Vision Publication
3.	Kristie Plantenberg, Engineering Graphics Essentials, University of Detroit Mercy, SDC Publication
4.	AutoCAD 2016 for Engineers & Designers, 22nd edition Vol 1 & 2; Prof. Sham Tickoo, Dreamtech Press
Useful Links	
1.	https://nptel.ac.in/courses/112103019/
2.	https://www.standardsmedia.com/IS-SP-46--Engineering-Drawing-Practice-for-Schools-and-Colleges-4915-book.html
3.	http://www.engineering108.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	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	✓			✓											
CO 2	✓	✓													
CO 3	✓			✓			✓		✓						
CO 4	✓	✓		✓		✓			✓	✓	✓				

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember			10	
Understand			10	
Apply			10	
Analyse			10	
Evaluate			-	
Create			10	
TOTAL			50	

Government College of Engineering, Karad				
First Year B. Tech				
FE1105: Engineering Physics Lab				
Teaching Scheme			**Examination Scheme**	
Practical	02 Hrs/week		CA	25
Total Credits	01		ESE	25

Course Outcomes (CO)

1.	To Hands on experience of crystal structure and its understand synthesis and characterization of Nano materials
2.	To understand Relevance of Ultrasonic waves and build a basic foundation with Solar and Wind Energy Trainer.
3.	To analyze behavior of light by Interference, Diffraction , Polarization and LASER
4.	To Verify photoelectric effect and Hall Effect.

	Course Contents
Experiment 1	Aim: Study of Seven crystal structure and symmetry elements of cubic.
Experiment 2	Aim: Study of Planes with the help of models related Miller Indices.
Experiment 3	Aim: Determine velocity of ultrasonic waves in liquid medium by interferometer.
Experiment 4	Aim: Find an object by Ultrasonic waves
Experiment 5	Aim: Calculation of divergence of LASER beam.
Experiment 6	Aim: Determination of wavelength of LASER using diffraction grating.
Experiment 7	Aim: To study interference pattern by Newtons ring Experiment.
Experiment 8	Aim: To determine the specific rotation of the given sample with the help of Polarimeter.
Experiment 9	Aim: To Calculate Resolving power of Telescope
Experiment 10	Aim: Verification of inverse square law of intensity of light/Photoelectric effect.
Experiment 11	Aim: Study introductory Nanokit
Experiment 12	Aim: To synthesize nano particals by spray Pyrolysis/CVD method
Experiment 13	Aim: To study behavior of material with temperature by TGDTA.
Experiment 14	Aim: Hall effect in Semiconductor
Experiment 15	Aim: Determination of energy gap in semiconductor.
Experiment 16	Aim: To study Fundamental of Solar Energy trainer/Wind energy Trainer

List of Submission	
1	Total number of Experiments = 10

Mapping of COs and POs

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

Assessment Pattern (with revised Bloom's Taxonomy)

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	√	√	√	√	√	√	√	√	√	√	
											25

Government College of Engineering, Karad				
First Year B. Tech				
FE1106: Programming for Problem Solving Lab				
Teaching Scheme			**Examination Scheme**	
Practical	04 Hrs/week		CA	50
Total Credits	02		ESE	50

Course Outcomes (CO)

1.	Able to implement basic c programming concepts
2.	Able to Analyse program behaviour and errors for different set of inputs
3.	Able to solve various problem statements by using c programming

	Course Contents
Experiment 1	Introduction to various components of programming environment
Experiment 2	Program for basic arithmetic operations like addition, subtraction, multiplication, division and expressions solving
Experiment 3	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 4	Program for Finding factorial of a number provided by the user.
Experiment 5	Program for calculating area of circle, triangle, rectangle, square by passing argument to a functions.
Experiment 6	Program for finding smallest and largest numbers from given 3 numbers from array.
Experiment 7	Program for searching numbers from given numbers from array by using linear and binary search.
Experiment 8	Program for performing matrix operation addition, subtraction using array.
Experiment 9	Program for performing string operations using string handling functions
Experiment 10	Program for storing and displaying Employee record using array of structure.
Experiment 11	Program for passing structure as an argument to a function
Experiment 12	Program for Swapping of two numbers using call by value and call by reference
Experiment 13	Program for demonstration of dynamic memory allocation using various functions.
Experiment 14	Program for simple read and write operations on file using character and string I/O.
Experiment 15	Program for performing read and write operations on file using random file operation.
List of Submission	
1	Total number of Experiments = 15

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															
CO 2															
CO 3															
CO 4															

Assessment Pattern (with revised Bloom's Taxonomy)

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	√	√	√	√	√	√	√	√	√	√	
											50

Government College of Engineering, Karad

First Year B. Tech.

FE 1107: Engineering Graphics & Design Lab

Teaching Scheme			Examination Scheme	
Practical	04 Hrs/week		CA/TA	50
Tutorials	-		ESE	50
Total Credits	02			

Course Outcomes (CO)

At the end of lab course

1.	Student will be able understand the basic principles of Technical/Engineering Drawing to improve the visualization skills using drafting software (Blooms cognitive level 1 & 2)
2.	Student will be able to establish the relationship between traditional drafting technique and computer aided drafting (Blooms cognitive level 3)
3.	The ability to demonstrates ideas and design concepts using drafting software. (Blooms cognitive level 2 & 3)
4.	Students will acquire requisite lifelong knowledge, techniques and attitude required for advanced study of engineering drawing by using CAD software's (Blooms cognitive level 3)
	Detailed contents
	Computer Graphics: Engineering Graphics Software; -Spatial Transformations; Orthographic Projections; Model Viewing; Co-ordinate Systems; Multi-view Projection; Exploded Assembly; Model Viewing; Animation; Spatial Manipulation; Surface Modelling; Solid Modelling; Introduction to Building Information Modelling (BIM)Angle; intersection.

	Course Contents	Hours
Unit 1	***Overview of Computer Graphics covering***, listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.; Isometric Views of lines, Planes, Simple and compound Solids];	**(05)**
Unit 2	***Customisation & CAD Drawing*** consisting of set up of the drawing page and the printer, including scale settings, Setting up of units and drawing limits; ISO and ANSI standards for coordinate dimensioning and tolerancing; **Orthographic constraints**, Snap to objects manually and automatically; Producing drawings by using various coordinate input entry methods to draw straight lines, Applying various ways of drawing circles;	**(05)**
Unit 3	***Annotations, layering & other functions covering*** applying dimensions to objects, applying annotations to drawings; Setting up and use of Layers, layers to create drawings, Create, edit and use customized layers; Changing line lengths through modifying existing lines (extend/lengthen); Printing documents to paper using the print command;	**(05)**
Unit 4	**Orthographic projection techniques**; Drawing sectional views of composite right regular geometric solids and project the true shape of the sectioned surface; Drawing annotation	**(05)**
Unit 5	***Planar projection theory***, including sketching of isometric, multi-view, section views. Dimensioning guidelines, tolerancing techniques; dimensioning and scale multi views of dwelling;	**(05)**
Unit 6	***Demonstration of a simple team design project*** Geometry and topology of engineered components: creation of engineering models and their presentation in standard 2D blueprint form and as 3D wire-frame and shaded solids. Use of solid-modelling software for creating associative models at the component and assembly levels; floor plans that include: windows, doors, and fixtures such as WC, bath, sink, shower, *etc*.	**(05)**

List of submission

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 B-spline or cubic spline.
Experiment 4	Drawing of front view and top view of simple solids like prism, pyramid, cylinder, *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 isometric projection of simple objects

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

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

Mapping of COs and POs

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

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember			20	10
Understand			10	20
Apply			10	10
Analyse			10	10
Evaluate			-	-
Create			-	-
TOTAL			50	50

Government College of Engineering, Karad

SCHEME OF INSTRUCTION & SYLLABI

Programme: (Physics group)

Scheme of Instruction for First Year of B. Tech. (UG) Degree in all Programmes

Semester – II

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Credits	EXAM SCHEME				
									CT1	CT2	TA/CA	ESE	TOTAL
1	BSC	FE1201	Mathematics – II	3	1	-	4	4	15	15	10	60	100
2	BSC	FE1202	Chemistry	3	1	-	4	4	15	15	10	60	100
3	ESC	FE1203	Engineering Mechanics	3	1	-	4	4	15	15	10	60	100
4	HSMC	FE1204	Professional Communication	2	-	-	2	2	15	15	10	60	100
5	BSC	FE1205	Chemistry – I Lab	-	-	2	2	1	-	-	25	25	50
6	ESC	FE1206	Engineering Mechanics Lab	-	-	2	2	1	-	-	50	50	100
7	ESC	FE1207	Workshop Manufacturing Practices	-	-	4	4	2	-	-	50	50	100
9	HMSC	FE1208	Professional Communication Lab	-	-	2	2	1	-	-	25	25	50
10	ESC	FE1209	Basic Engineering	3	-	-	3	1	-	-	-	50	50
			Total	**14**	**03**	**10**	**27**	**20**	**60**	**60**	**190**	**440**	**750**

L- Lecture T-Tutorial P-Practical
CT1- Class Test 1 TA/CA- Teacher Assessment/Continuous Assessment
CT2- Class Test 2 ESE- End

Course Category	HSMC (Hum., So. Sc, Mgmt.)	BSC (Basic Sc.)	ESC (Engg. Sc.)	PCC (Programme Core courses)	PEC (Programme Elective courses)	OEC (Open Elective courses)	MCC (Mandatory Courses)	Project / Seminar / Industrial Training
Credits	03	09	08	--	--	--	--	--
Cumulative Sum	03	18	16	--	--	--	--	--

Semester Examination (For Laboratory End Semester performance)

TOTAL CREDITS=17+20=37

Government College of Engineering, Karad

SCHEME OF INSTRUCTION & SYLLABI

Programme : ALL (Chemistry group)

Scheme of Instruction for First Year of B. Tech. (UG) Degree in all Programmes

Semester – I

Mandatory 03-week Induction Program in the first semester for every student.

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Credits	EXAM SCHEME				
									CT1	CT2	TA/CA	ESE	TOTAL
1	BSC	FE1101	Mathematics – I	3	1	-	4	4	15	15	10	60	100
2	BSC	FE1102	Physics	3	1	-	4	4	15	15	10	60	100
3	ESC	FE1103	Programming for Problem Solving	3	-	-	3	3	15	15	10	60	100
4	ESC	FE1104	Engineering Graphics and Design	1	-	-	1	1	-	-	50	-	50
5	BSC	FE1105	Physics Lab	-	-	2	2	1	-	-	25	25	50
6	ESC	FE1106	Programming for Problem Solving Lab	-	-	4	4	2	-	-	50	50	100
7	ESC	FE1107	Engineering Graphics and Design Lab	-	-	4	4	2	-	-	50	50	100
			Total	**10**	**02**	**10**	**22**	**17**	**45**	**45**	**205**	**305**	**600**

L- Lecture T-Tutorial P-Practical

CT1- Class Test 1 TA/CA- Teacher Assessment/Continuous Assessment

CT2- Class Test 2 ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	HSMC (Hum., So. Sc, Mgmt.)	BSC (Basic Sc.)	ESC (Engg. Sc.)	PCC (Programme Core courses)	PEC (Programme Elective courses)	OEC (Open Elective courses)	MCC (Mandatory Courses)	Project / Seminar / Industrial Training
Credits	--	9	8	--	--	--	--	--
Cumulative Sum	--	9	8	--	--	--	--	--

TOTAL CREDITS=17

Government College of Engineering, Karad

First Year B. Tech

FE1201: Engineering Mathematics-II

Teaching Scheme			Examination Scheme	
Lectures	03 Hrs/week		CT – 1	15
Tutorials	01 Hrs/week		CT – 2	15
Total Credits	04		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

1.	Use mathematical tools needed in evaluating multiple integrals and their usage
2.	Apply effective mathematical tools for the solutions of differential equations that model physical processes
3.	Use tools of differentiation and integration of functions of a complex variable that are used in various techniques dealing engineering problems
4.	To learn Integral calculus which would enable students to find engineering solutions for given situations they may encounter in their profession.

	Course Contents	Hours
Unit 1	**First Order Ordinary Differential Equations:** Exact equations, Integrating Factor, Equations reducible to Exact, linear and Bernoulli's equations, Applications to simple Electrical circuits, Mechanics	**(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	**(6)**
Unit 3	**Function of Complex Variable:** Differentiation: Calculus of functions of complex variable, Cauchy-Riemann equations, analytic functions, harmonic functions, finding harmonic conjugate; zeros of analytic functions, singularities, Integration: Cauchy's Theorem, Cauchy Integral formula (without proof), Cauchy Residue theorem (without proof)	**(6)**
Unit 4	**Numerical Methods:** Solution of Ordinary differential equations: by Taylor's Series, Picard's Method. Runge-Kutta fourth order method for solving first order differential equations. Trapezoidal rule and Simpson's 1/3rd and 3/8 rules	**(4)**
Unit 5	**Multivariable Calculus:** Double integration (Cartesian and Polar coordinates), Change of order of double integration. Triple integration (Cartesian, spherical polar, cylindrical polar coordinates)	**(7)**
Unit 6	**Applications to Multiple Integrals** : Area and Volume.	**(6)**
Tutorials		**(12)**

Text Books

1.	H.K.DAS "Advance Engineering Mathematics" S. Chand publications
2.	Debashis Datta "Textbook of Engineering Mathematics'' New Age International Publication
3.	"Engineering Mathematics A Tutorial Approach". Ravish R..Singh, Mukul Bhatt.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.	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, 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															
CO 2															
CO 3															
CO 4															

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	√	√	√	√
Understand	√	√	√	√
Apply	√	√	√	√
Analyse	√	√	√	√
Evaluate	√	√	√	√
Create			√	
TOTAL	15	15	10	60

Government College of Engineering, Karad

First Year B. Tech

FE1202 Engineering Chemistry

Teaching Scheme			Examination Scheme	
Lectures	03 Hrs/week		CT – 1	15
Tutorials	01 Hrs/week		CT – 2	15
Total Credits	04		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

1.	Student will able to know Qualitative and Quantitative analysis of compound. Students will able to know new analytical techniques will be compared with classical methods
2.	Study of synthesis of nanomaterials and its uses in medical and engineering fields and their use in nonconventional energy sources in present context.
3.	Study of phase rule will able to student to study the effect of temperature and pressure on chemical substance
4.	Students will able to know the nanomaterials and their applications by using know principles of green chemistry i.e. use of environmentally benign chemistry

	Course Contents	Hours
Unit 1	**Qualitative and Quantitative methods of Analysis** Introduction, Chemical analysis and its types, no instrumental methods- Titrimetric and types, Gravimetry and its application, Instrumental Methods- Electromagnetic spectrum and it's characteristics, interaction of Electromagnetic radiations with matter, Principle, Instrumentation, calibration, working and applications of UV-Visible, Atomic Absorption, Infrared Spectroscopy	**(7)**
Unit 2	**Phase Rule** Gibb's Phase rule- statement and explanation of term involved in With example, one component system-Water system, Reduced Phase rule, simple eutectic system i.e Pb-Ag and Bi-Cd, Diagram of iron carbon system	**(6)**
Unit 3	**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, Protection from corrosion – Cathodic and anodic protection	**(6)**
Unit 4	**Nanomaterials-** Introduction, Nanomaterials- preparation of CNT by different methods, CNT properties and applications, characterization method for Nano materials, SEM (Scanning Electron Microscope), AFM (Atomic Force Microscopy), STM ('Scanning Tunneling Microscopy)	**(4)**
Unit 5	**Environmental & Green Chemistry** Air, water and noise pollution. Optimum levels of pollution. Significance and determination of COD and BOD. Solid waste treatment of collection of NKP. Greenhouse effect and global Warming. e-Waste. Radioactive pollution. Applications of green chemistry and green technology. Concept of atomic and molecular economy and its use in green chemistry.	**(7)**
Unit 6	**Energy Science** Fuel, classification, characteristics of good fuel, comparison between solid, liquid, gaseous fuel. Calorific value, low and high calorific value, units of calorific value, determination of calorific value by Bomb and Boy's calorimeter, fuel cell and it's types, applications, Thermal analysis and it's types – Principle, instrumentation, working and applications of thermo gravimetric analysis.	**(6)**
Tutorials		**(12)**

Text 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.	A text Book of Engineering Chemistry by Shashi Chawla, Dhanpat Rai& Co. (Pvt.) Ltd, Delhi

References

1.	Chatwal and Anand, Instrumental Methods of Chemical Analysis, Himalaya Publishing House, New Delhi.
2.	A Textbook of Engineering Chemistry by S. S. Dara and S. S. Umare, S. Chand & Company Ltd., New Delhi
3.	A text Book of Engineering Chemistry by Shashi Chawla, Dhanpat Rai& Co. (Pvt.) Ltd, Delhi
4.	Energy scenario beyond 2100 by Muthukrishna iyer
5.	A text of Environmental chemistry, by O.D.Tyagi,and M.Mehra

Useful Links	
1.	NPTEL, www.nptel.ac.in
2.	4 http://www.schandpublishing.com

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															
CO 2															
CO 3															
CO 4															

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	√	√	√	√
Understand	√	√	√	√
Apply	√	√	√	√
Analyse	√	√	√	√
Evaluate	√	√	√	√
Create			√	
TOTAL	15	15	10	60

Government College of Engineering, Karad

First Year B. Tech

FE1203: Engineering Mechanics

Teaching Scheme			Examination Scheme	
Lectures	03 Hrs/week		CT – 1	15
Tutorials	01 Hrs/week		CT – 2	15
Total Credits	04		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

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 kinematics of linear motion, Work energy principal, De Alembert's principle, Impulse - momentum principle, Collision of elastic bodies

	Course Contents	Hours
Unit 1	Basic concepts and fundamental laws, force, resolution and composition of force, system of forces, resultant, Lami's theorem, free body diagram, two force and three force members, Equilibrium of forces, equilibrium equations, equilibrant force, Moment and couple, Varignon's theorem and law of moments	**(7)**
Unit 2	Beams: Types of loads, types of supports, analysis of simple and compound beams, virtual work method for support reactions. Friction: Concept of friction, angle of friction, angle of repose, cone of friction, wedge blocks, Concept of dynamic friction	**(6)**
Unit 3	Types of trusses, Assumption, Method of Analysis: Method of Joints, Method of section, Analysis of simple truss with max. 7 members, Introduction to space truss	**(6)**
Unit 4	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, Concept of mass moment of inertia	**(4)**
Unit 5	Kinematics of rectilinear motion, motion curves, Newton's motion Law, Projectile, relative velocity	**(7)**
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	**(6)**
Tutorials		**(12)**

Text Books

1.	Engineering Mechanics, S. S. Bhavikatti,New Age International Pvt. Ltd.
2.	Engineering Mechanics, R. K. Bansal and Sanjay Bansal, Jain Bros. Publishers, Delhi
3.	Textbook of Applied Mechanics",Ramamrutham. S,DhanpatRai Publications, 1987 4 Engineering Mechanics(Statics and Dynamics),Palanichamy, M. S., and Nagan, S

References

1.	Vector Mechanics for Engineers Vol.-I and II, F. P. Beer and E. R. Johnston, Tata Mc- Graw Hill Publication
2.	Engineering Mechanics, Irving H. Shames, Prentice Hall of India, New Delhi
3.	Engineering Mechanics, S. N. Saluja, Satya Prakashan, New Delhi

Useful Links

1.	NPTEL, www.nptel.ac.in
2.	http://www.schandpublishing.com
3.	Study.com/directory/category/Engineeringmechanics

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															
CO 2															
CO 3															
CO 4															

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	√	√	√	√
Understand	√	√	√	√
Apply	√	√	√	√
Analyse	√	√	√	√
Evaluate	√	√	√	√
Create			√	
TOTAL	15	15	10	60

Government College of Engineering, Karad

First Year B. Tech

FE1204: Professional Communication

Teaching Scheme			Examination Scheme	
Lectures	02 Hrs/week		CT – 1	15
Tutorials	00 Hrs/week		CT – 2	15
Total Credits	02		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

1.	Use appropriate vocabulary in each situation
2.	Use variety of accurate sentence structures in each situation
3.	Generate coherent content supported with relevant details
4.	Use communication strategies to participate in academic & non-academic activities

	Course Contents	Hours
Unit 1	**Listening Skill** Listening Stories – I (Listen and reproduce [oral]) Listening Discourse &Motivational Talks – II (Listen and summarize [written]), Listening Interviews – III (Listen and answer the questions)	**(7)**
Unit 2	**Vocabulary Building** 1. Root Words 2. Synonyms, Antonyms, Close Synonyms (e.g. see, observe, stare, glare, view, etc.) 3. Formal and. Informal Vocabulary 4. Problem Words, Homonyms, Homophones 5. Common Errors: Usage of - Prepositions, Tenses, Articles	**(6)**
Unit 3	**Speaking Skills** 1. Basic Sentence Patterns 2. Types of Sentences: Statements, Interrogative, Exclamatory, Imperative (Order, Command, Request, Advice, Suggestions/Proposals) 3. Expressing Situation based Emotions (Formal & Informal): Apology, Greetings, Regrets, Condolences, Offer, Invitation, Compliments, Compulsion, Permission, Agreement, Disagreement, Interruption 4. Introducing Yourself and others	**(6)**
Unit 4	**Writing Skills** 1. E-mail writing and Etiquettes (Formal & Informal) 2. Job Application, Curriculum Vitae or Resume and Covering Letter (Difference between CV and Resume, Format, effective use of language) 3. Essay Writing	**(4)**
Unit 5	**Developing Presentation Skills** 1. Group Discussion: Dos and Don'ts (subject knowledge, approach to a problem, ability, analytical mind, listening skill, decision-making capacity, critical thinking, leadership, tolerance, your attitude, and confidence) 2. Presentation Techniques (Designing/Effective delivery/Body language) 3. Interview Techniques (Communication skills, Body Language, leadership quality, problem-solving capacity, teamwork, etc.)	**(7)**
Unit 6	Developing Soft Skills (Activity-Based) 1. Team Building (understanding the concept of team-building, communication skills, goal setting, role-setting, a delegation of task, brainstorming, encouragement, etc) 2. Creative thinking (concept understanding, open perspective, reformulating a problem, brainstorming, mind mapping, analyzing, etc.) 3. Stress Management (concept understanding, identifying the problem, limiting unnecessary stress, accepting the things you can't change, following a healthy lifestyle, connecting to others, spending time for fun & relaxation, exercising /meditating, etc.) 4. Emotional Intelligence (concept understanding, knowing self-strengths & weaknesses, managing self, feeling empathy, employing social skills)	**(6)**

Text Books	
1.	Kiranmai, Dutt P. and Rajeevan Geeta. (2013) Basic Communication Skills. N. Delhi: Foundation Books.
2.	Comfort, Jeremy, et al. (2011) Speaking Effectively: Developing Speaking Skills for Business English.Cambridge: Cambridge University Press. (Reprint)
3.	Krishnaswami, N. and Sriraman, T. (2000) Creative English for Communication. India: Macmillan
Reference Books	
1.	Rutherfoord, Andrea J. (2002). Basic Communication Skills for Technology. Delhi: Pearson Education Asia
2.	Bonamy, David. (2011). English Skills for Technical Students. Orient Blackswan.
3.	Viswamohan, Aysha. (2008) English For Technical Communication. (with CD) McGraw Hill Education
4.	Mohan, Krishna & Meera Banerji. (2009) Developing Communication Skills. (2nd ed.) India: Macmillan
5.	Maison, Margaret M. (2011) Examine your English. India: Orient Longman
6.	Krishnaswami, N. and Sriraman, T. (2000) Creative English for Communication. India: Macmillan
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 ↓	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															
CO 2															
CO 3															
CO 4															

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	√	√	√	√
Understand	√	√	√	√
Apply	√	√	√	√
Analyse	√	√	√	√
Evaluate	√	√	√	√
Create			√	
TOTAL	15	15	10	60

Government College of Engineering, Karad				
First Year B. Tech				
FE1205: Engineering Chemistry Lab				
Teaching Scheme			**Examination Scheme**	
Practical	02 Hrs/week		CA	25
Total Credits	01		ESE	25

Course Outcomes (CO)

1.	The student will understand the precautions during handling of different chemicals and glassware
2.	The students will able to know water quality parameter and their permissible limit in potable water.
3.	The student will able to know synthesis of polymer and its uses.
4.	The students will able to know construction, working of bomb Calorimeter

	Course Contents
Experiment 1	Aim: To Determine the total hardness of water Objective: Students should able to understand the hardness of water and potability of water
Experiment 2	Aim: To Determine the percentage of zinc from brass Objective: Students should able to understand how much zinc present in brass alloy and its type.
Experiment 3	Aim: To determine the calorific value of coal by using bomb calorimeter. Objective: Students should able to understand calorific value of coal and its quality.
Experiment 4	Aim: To determine the chloride content from water Objective: Students should able to know permissible limit of chlorine in water used for drinking purposes and its bad effect.
Experiment 5	Aim: Preparation of urea formaldehyde Objective: Preparation of polymer (advanced material)
Experiment 6	Aim: Preparation of phenol formaldehyde. Objective: Preparation of polymer (advanced material)
Experiment 7	Aim: To Determine the amount of dissolved oxygen in water Objective: Students should able to know amount of dissolved oxygen and its importance in waste
Experiment 8	Aim: Determination of alkalinity of water Objective: Effect of alkaline water on living and non-living things
Experiment 9	Aim: Verification of Lambert's-Beer's law Objective: The students will able to know concentration of unknown solution
Experiment 10	Aim: Determination of pH of solution Objective: To know the PH of different solutions like industrial waste and potable water
List of Submission	
1	Total number of Experiments = 10

Mapping of COs and POs

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

Assessment Pattern (with revised Bloom's Taxonomy)

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	√	√	√	√	√	√	√	√	√	√	
											25

Government College of Engineering, Karad					
First Year B. Tech					
FE1206: Engineering Mechanics Lab					
Teaching Scheme			**Examination Scheme**		
Practical	02 Hrs/week		CA	50	
Total Credits	01		ESE	50	

Course Outcomes (CO)

1.	To study basic concepts and fundamental laws, force, moment and couple
2.	To study Varignon's theorem and law of moments, Lami's theorem, free body diagram
3.	To study the moment of inertia of a Flywheel.
4.	To 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
Experiment 9	Verification of Newton's second law of motion by Fletcher's trolley

Drawing Sheet No.1 To find resultant - 3 problems
Drawing Sheet No.2 To find support reactions - 3 problems

List of Submission

	Total number of Experiments – 8 2 Total number of sheets – 2 3 At least three problem on each unit of theory course

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															
CO 2															
CO 3															
CO 4															

Assessment Pattern (with revised Bloom's Taxonomy)

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	√	√	√	√	√	√	√	√	√	√	
											50

Government College of Engineering, Karad				
First Year B. Tech.				
ESC 1207 : Workshop/Manufacturing Practices				
Teaching Scheme			**Examination Scheme**	
Practical	04 Hrs/week		TA	50
Total Credits	02		ESE	50

Course Outcomes (CO)

1.	Students will able to understand different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.
2.	students will able to remember use of marking tools, hand tools, measuring instruments (mechanical and electrical) and to work to prescribed dimensions/tolerances
3.	Students will able to create good workmanship
4.	Students will able apply various manufacturing skills to engineering applications

	Course Contents	Hours
I	Machine shop	**[6]**
II	Fitting shop	**[6]**
III	Carpentry	**[6]**
IV	Electrical & Electronics	**[6]**
V	Welding shop	**[6]**
VI	Casting	**[6]**
VII	Smithy	**[6]**
VIII	Plastic moulding & Glass Cutting	**[6]**

Text Books

1.	Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
2.	Kalpak Jain, Steven S. Schmidt, "Manufacturing Engineering and Technology", 4th edition, Pearson Education Indian Edition, 2002.
3.	Gowri P., Hariharan and A. Suresh Babu,"Manufacturing Technology – I" Pearson Education, 2008.
4.	Roy A. Lindberg, "Processes and Materials of Manufacture", 4th edition, Prentice Hall India, 1998.
5.	Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata Mc Graw Hill House, 2017.
6.	Chapman series on Manufacturing process

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															
CO 2															
CO 3															
CO 4															

Assessment Pattern (with revised Bloom's Taxonomy)

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	√	√	√	√	√	√	√	√	√	√	
											50

Government College of Engineering, Karad				
First Year B. Tech				
FE1208: Professional communication lab				
Teaching Scheme			**Examination Scheme**	
Practicals	02 Hrs/week		TA	25
Total Credits	01		ESE	25

Course Outcomes (CO)	
1.	To develop English language communication
2.	To improve Employability Skills.
3.	To build the skillsets for aspiring career opportunities.
4.	To achieve professional grooming.

	Course Contents
Experiment 1	Aim: Listening (Oral)
Experiment 2	Aim: Listening (Written).
Experiment 3	Aim: Listening (Answering)
Experiment 4	Aim: Root Words (Worksheet)
Experiment 5	Aim: Synonyms & Antonyms (App based Test)
Experiment 6	Aim: Sentence making activity
Experiment 7	Aim: Expressing situation-based emotions (Role Play)
Experiment 8	Aim: Introducing yourself & others (JAM)
Experiment 9	Aim: Email Writing Practice
Experiment 10	Aim: CV Writing and Resume on O2 application
Experiment 11	Aim: Essay Writing
Experiment 12	Aim: Group Discussion
Experiment 13	Aim: Mock Interview
Experiment 14	Aim: Activity 1- Team Building
Experiment 15	Aim: Activity 2- Team Building

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															
CO 2															
CO 3															
CO 4															

Assessment Pattern (with revised Bloom's Taxonomy)

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	√	√	√	√	√	√	√	√	√	√	
											25

Government College of Engineering, Karad

First Year B. Tech

FE 1209 Basic Engineering

Teaching Scheme			Examination Scheme	
Lectures	03 Hrs/week		ESE	50
Tutorials	00 Hrs/week			
Total Credits	01			

Course Outcomes (CO)

1.	Students will be able to know & Understand the working of engine, Refrigeration system, Turbomachinery
2.	Students will be able to know & Understand the basic material properties manufacturing processes, Power Transmission Machine elements
3.	Students will be able to do Building Planning and Byelaws & regulations as per SP-7 and Components of Buildings and their functions
4.	Students will be able to know and understand Building Design criteria and building materials

	Course Contents	Hours
Unit 1	An Introduction to Second Law of Thermodynamics, Air standard cycles- Carnot Cycle, Otto Cycle Construction and Working of C.I. and S.I. Engine, Two stroke, Four Stroke Pump, compressor and water turbine working and application Applications of refrigeration and air conditioning, Vapor compression refrigeration system	**(7)**
Unit 2	**Manufacturing Processes:** Turning, milling, drilling. Material properties, tensile, compressive and shear strength, ductility, malleability, hardness. **Mechanical Power Transmission**: Machine elements: Axle, shaft, keys, pulleys, etc. Belt drives, gear drives, chain drives, Applications of these devices (Numerical treatment on Torque, speed, power for belt and gear drive only)	**(6)**
Unit 3	**Introduction-** Application of civil engineering in other allied fields, Principles of building planning, Bye-Laws, Components of Buildings, Types of loads on building, Load bearing and Framed structures, Building Materials	**(6)**
Unit 4	**Surveying & Levelling:** Principles & Classification of surveys, Types of levelling, Contours, Characteristics of contours, Introduction and use of Total Station Introduction to Infrastructure Projects: Transportation Projects, Water Resources Systems, Supply Chain Management Systems, Water Supply and Sanitation Systems	**(4)**
Unit 5	Single phase & three phase A.C. Circuits- Generation of single phase sinusoidal a. c. voltage,R.M.S. and Average value ,form factor, peak factor, impedance ,admittance , R-L-C series circuit, Introduction to 3 phase supply and its necessity, Generation of three phase A.C. voltage, relation between line and phase quantities, power in three phase circuits	**(7)**
Unit 6	**Electrical Machines-** Single Phase Transformer: Construction, operating principle, Types, emf equation, voltage and current ratio, losses, efficiency, voltage regulation. Electrical Motors: Types, working principles of DC motor, Single phase Induction motor, Three phase Induction motor, applications of motors.	**(6)**
Tutorials		**(12)**

Text Books

1.	V Ganeshan , “Internal Combustion Engine”, Tata McGraw Hill publication 2015
2.	E Radhakrishanan , “Fundamentals of engineering thermodynamics’, Prentice hall publication, 2018
3.	Rajput R S “Thermal Engineering’, Charoter pub, 2012

References

1.	V D Kodgire “Material Science And Metallurgy” Everest Publishers
2.	S.K. Hajara Choudhury “ Workshop Technology Vol-I” Media Promoters and Publishers
3.	G.K. Hiraskar (Basic Civil Engineering by Dhanpat Rai Publication.
4.	Mechanical Engineering Design, J. E. Shigley, MGH New York
5.	B.C. Punmia, Surveying, Vol.- I, Vol.-II
6.	Kothaii , Nagrath, “ Basic Electrical Engineering”, Tata McGraw Hill New Delhi, 3rd edition 2009. Kothari

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
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