KUMARAGURU COLLEGE OF TECHNOLOGY

(An Autonomous Institution Affiliated to Anna University, Chennai)

COIMBATORE – 641049

REGULATIONS 2017

CURRICULUM

I - II Semesters

Department of Automobile Engineering

Version 1 (17.8.17)

KUMARAGURU COLLEGE OF TECHNOLOGY, COIMBATORE – 641 049

REGULATIONS 2017

B.E AUTOMOBILE ENGINEERING

CURRICULUM

SEMESTER-I

Course Code	Course Title	Course category	Course Mode	L	T	P	PJ	C
U17ENI1201	English for Cognizance	HS	Embedded	1	0	2	0	**2**
U17MAT1101	Linear Algebra and Calculus	BS	THEORY	3	1	0	0	**4**
U17PHT1002	Physics for Automobile Engineering	BS	THEORY	3	0	0	0	**3**
U17CHT1001	Chemistry for Automobile Engineering	BS	THEORY	3	0	0	0	**3**
U17MET1101	Engineering Graphics	ES	THEORY	2	1	0	0	**3**
U17CSI1211	Structured Programming using C	ES	Embedded	3	0	2	0	**4**
U17PHP1501	Physics Laboratory	BS	LAB	0	0	2	0	**1**
U17MEP1501	Engineering Practices Laboratory	ES	LAB	0	0	2	0	**1**
U17VEP1501	Personal Values	HS	LAB	0	0	2	0	**1**
Total Credits								**22**
Total Periods per week								**27**

SEMESTER-II

Course Code	Course Title	Course category	Course Mode	L	T	P	PJ	C
U17ENE___	Language Electives	HS	LAB	0	0	4	0	**2**
U17MAT2101	Advanced Calculus and Laplace Transforms	BS	THEORY	3	1	0	0	**4**
U17PHT2002	Material Science for Automobile Engineering	BS	THEORY	3	0	0	0	**3**
U17CHT2001	Metallurgical Chemistry for Automobile	BS	THEORY	3	0	0	0	**3**
U17MET2102	Engineering Mechanics	ES	THEORY	3	1	0	0	**4**
U17EET2013	Introduction to Electrical and Electronics Engineering	ES	THEORY	3	0	0	0	**3**
U17CHP2501	Chemistry Laboratory	BS	LAB	0	0	2	0	**1**
U17EEP2511	Electrical and Electronics Engineering Lab	ES	LAB	0	0	2	0	**1**
U17VEP2502	Inter-Personal values	HS	LAB	0	0	2	0	**1**
U17ISR2001	Social Immersion Project	eRIDE	Project	0	0	0	4	**2**
Total Credits								**24**
Total Periods per week								**31**

Semester 1

U17ENI1201 – ENGLISH FOR COGNIZANCE

L	T	P	J	C
1	0	2	0	2

(Common to all branches of Engineering and Technology)

COURSE OUTCOMES

After the course the Student will be able to:

CO1: Understand and appreciate vocabulary and syntax with accuracy and clarity.

CO2: Communicate effectively by using appropriate grammar and technical parlance in a range of academic scenarios.

CO3: Interpret and critically evaluate discourses related to functional English.

CO4: Comprehend critical text leading to academic articulation.

CO5: Disseminate professional information through appropriate means of communication.

CO6: Demonstrate an understanding for innovative language learning strategies and write texts applying registers formats and language appropriate to the context.

CO/PO Mapping

(S/M/W indicates strength of correlation)S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)												PSO	
	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
CO1				M		S	M		M	S	S	M		
CO2				M		S	M		M	S	S	M		
CO3				M		S	M		M	S	S	M		
CO4				M		S	M		M	S	M	M		
CO5				M		S	M		M	S	M	M		
CO6				M		S	M		M	S	M	M		

Course Assessment methods

Direct
1. Continuous Assessment 2. Cooperative learning 3. Assignment 4. Presentation 5. End Semester Examination
Indirect
1. Course-end survey

AUDITORY PERCEPTION **12**

Listening for understanding & information - short announcements, short conversations, telephonic conversation; Listening to British, American, Australian and Neutral Accent of Indian English; Listening and synthesizing information; Listening to TED/INK Talks (General); Critical review of short films, documentaries.

ORAL FLUENCY **12**

Informal introduction of self and others, conversation starters, articulating simple thoughts and ideas with clarity, Seeking Permission, Talking about People and Places. Describe an object or event. Retelling an incident, voicing opinions, persuasion skills, speaking from a single perspective (debate) - preparing and delivering an informal talk, Introduction to Presentation Skills – Formal tone – Impersonal style - Structuring and Presenting information. Transcode graphics orally.

FOUNDATIONS OF ACADEMIC WRITING **12**

Plan and write a library-based coursework assignment on an Engineering topic. Read academic textbooks and journal articles. Research and analyse scientific data and express understanding. Procuring information - Identifying research papers in a specific discipline, reading abstracts of research papers, reading the abstract of projects, reading articles from journals and publications and documenting/ archiving information.

TRAITS OF RESEARCH WRITING **12**

Reading research articles and summarizing. Review of Secondary sources - Writing an abstract - Writing an introduction to a paper in academic writing - Avoiding plagiarism – Bibliography – International Academic Styles of writing a research paper - Peer Evaluation.

PROCESS OF PREPARING A RESEARCH ARTICLE **12**

Research Projects – Converging areas of interest into field of research - Identifying the problem of research – Formulating hypothesis – Research Objectives – Literature Review – Identifying the research gap - Research methodology – Requirements – Plan of work – Result and Discussion – Conclusion – References – Appendices.

L: 0 P: 60 Total: 60 Hours

Reference Books:

1. English and Communication Skills—S.P.Dhanavel—Orient Blackswan Pvt Lted, Hyderabad.

2. Effective Technical Communication—Ashraf Rizvi—Tata McGraw Hill, New Delhi.

3. A Course in Communication Skils—Kiranmai Dutt, Geetha Rajeevan, C.L.N.Prakash—Foundation Books, New Delhi.

U17MAT1101 **Linear Algebra and Calculus**
(Common to AE, AUE, CE, MCE, ME)

L	T	P	J	C
3	1	0	0	4

Course Outcomes

After successful completion of this course, the students should be able to

CO1 :Identify eigen values and eigen vectors , apply Cayley Hamilton theorem and convert quadratic form to canonical form. K3

CO2 : Determine the radius, centre, circle of curvature of functions K4

CO3 : Discover the evolutes of curves and the envelope of a family of curves. K4

CO4 : Solve first order ordinary differential equation and apply in some physical situations. K4

CO5 : Solve higher order ordinary differential equations and apply the knowledge to physical situations K4

CO6 Evaluate the total derivative of a function, expand the given function as series and locate the maximum and minimum for multivariate functions. K4

Pre-requisites :

Nil

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	S							M	M		M
CO2	S	S							M	M		M
CO3	S	S							M	M		M
CO4	S	S							M	M		M
CO5	S	S							M	M		M
CO6	S	S							M	M		M

Course Assessment methods

Direct

1. Continuous Assessment Test I, II
2. Open book test; Cooperative learning report, Assignment; Journal paper review, Group Presentation, Project report, Poster preparation, Prototype or Product Demonstration etc. (as applicable)
3. End Semester Examination

Indirect

1. Course-end survey

MATRICES **9 + 3 Hours**

Rank of a matrix – Linearly dependent and independent vectors – Eigen values and eigen vectors of a real matrix – Properties of eigen values and eigen vectors – Cayley Hamilton theorem (excluding proof) – Orthogonal matrices – Orthogonal transformation of a symmetric matrix to diagonal form – Reduction of quadratic form to canonical form by orthogonal transformation.

GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS **4 + 1 Hours**

Curvature – Radius, Centre and Circle of curvature in Cartesian, Parametric and Polar form

EVOLUTES AND ENVELOPES **5 + 2 Hours**

Evolute – Envelope of family of curves with one and two parameters – Evolute as the envelope of normals – properties of evolute and envelope.

FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS **9 + 3 Hours**

Leibnitz's equation – Bernoulli's equation – Equations of first order and higher degree - Clairauts form – Applications: Orthogonal trajectories and Newton's law of cooling

HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS **9 +3 Hours**

Linear equations of second and higher order with constant coefficients – Euler's and Legendre's linear equations – Method of variation of parameters – First order Simultaneous linear equations with constant coefficients - Application - Mass-spring mechanical system. (Differential equations and associated conditions should be given).

FUNCTIONS OF SEVERAL VARIABLES **9 +3 Hours**

Total derivative – Taylor's series expansion – Maxima and minima of functions of two variables – Constrained maxima and minima: Lagrange's multiplier method with single constraints – Jacobians.

Theory: 45 Tutorial: 15 Practical: 0 Project: 0 Total : 60 Hours

REFERENCES

1. Kreyzig E., "Advanced Engineering Mathematics", Eighth Edition, John Wiley and sons, 2010.
2. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition.
3. Veerarajan T., Engineering Mathematics (for First Year), Tata McGraw Hill Pub. Co. Ltd., New Delhi, Revised Edition, 2007.
4. Kandasamy P., Thilagavathy K., and Gunavathy K., "Engineering Mathematics", S. Chand & Co., New Delhi, (Reprint) 2008.
5. Arunachalam, T., Engineering Mathematics I, Sri Vignesh Publications, Coimbatore. (Revised) 2009.
6. Venkataraman M.K., "Engineering Mathematics", The National Pub. Co., Chennai,2003.
7. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, (2007).

E books and online learning materials

(1) Advanced Engineering Mathematics, P. V. O'Neil, 5th Indian reprint, 2009, Cengage Learning India Pvt. Ltd.

(2) Advanced Engineering Mathematics, Dennis Zill Warren S Wright Michael R. Cullen, 4th edition, 2011, Jones & Bartlett Learning.

Online Courses and Video Lectures:

www.mathworld.wolfram.com

http://nptel.ac.in

U17PHT1002 Physics for Automobile Engineering

L	T	P	J	C
3	0	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Various engineering subjects and applications.

CO2: Crystal structure identification of engineering materials

CO3: Application of lasers and optical fibers in engineering and technology

CO4: Perceive the basics of quantum and its applications

CO5: Understand the concepts of production and detection of ultrasonic waves for various applications.

CO6: Acquire the knowledge of various materials testing procedures.

Pre-requisites :

NIL

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	M										M
CO2	S	M			S							M
CO3	S	M			S							M
CO4	S	M			S							M
CO5	S	M			S							M
CO6	S	M					M					M

Course Assessment methods

Direct

4. Continuous Assessment Test I, II 5. Assignment; Journal paper review, Group Presentation, Project report, End Semester Examination
Indirect
1. Course-end survey

CRYSTAL PHYSICS **9 Hours**

Space lattice – unit cell – lattice planes – Bravais space lattices – Miller indices – calculation of interplanar distances – atomic radius – co- ordination number – packing factor for SC, BCC, FCC and HCP structures- crystal imperfections: point defects – line defects – surface defects – volume defects – effect of crystal imperfections.

APPLIED OPTICS **9 Hours**

Air wedge and its applications - Lasers – spontaneous and stimulated emissions – Einstein's coefficients – Types of LASER – Nd : YAG, CO_2 and semiconductor laser – Homo junction (qualitative description) – applications –Holography (Qualitative only) – optical fiber – principle and propagation of light in optical fibers – numerical aperture and acceptance angle –types of optical fibers – light sources and detectors – communication system.

QUANTUM PHYSICS **9 Hours**

Introduction - Planck's quantum theory of black body radiation (derivation) – photo electric effect(Qualitative only) – Compton effect (derivation) and experimental verification of Compton effect – De-Broglie's concept - Schrodinger wave equation – time independent and time dependent equations (derivations) – physical significance of wave function – particle in a box (one dimensional case) – electron microscope – scanning electron microscope – transmission electron microscope.

ULTRASONICS **6 Hours**

Ultrasonics: Production of ultrasonics: magnetostriction oscillator - piezo electric method – properties –detection – acoustic grating – application of Ultrasonic's in automotive industries

MATERIALS TESTING **12 Hours**

Destructive: Mechanism of plastic deformation, slip and twinning – types of fracture – testing of materials under tension, compression and shear loads – Hardness tests (Brinell, Vickers and Rockwell) Impact test Izod and charpy, fatigue and creep test. Non Destructive: Liquid Penetrant method – ultrasonic flaw detector: A scan, B scan, C scans – X- ray radiography and fluoroscopy – thermography.

Theory: 45	**Tutorial: 0**	**Practical: 0**	**Project: 0**	**Total: 45 Hours**

REFERENCES

1. Avadhanulu M.N. and Kshirsagar P.G., A textbook of Engineering Physics, S.Chand& Company Ltd, New Delhi,2005.
2. Gaur R.K. and Gupta S.L., Engineering Physics, 8th edition, DhanpatRai Publications (P) Ltd., New Delhi, 2003.
3. Richard Wolfson, ―Essential University Physics, Vols. 1 and 2. Pearson Education, Singapore, 2011.
4. Crawford Jr Waves, F.S. – Berkeley Physics Course, Vol. 3, 2008.
5. Rajendran V, Applied Physics, Tata McGraw Hill Publishing Company Limited, New Delhi, 2003.
6. Sydney H.Avner "Introduction to Physical Metallurgy" McGraw-Hill Book Company, 1994.
7. Purcell, E.M, ―Electricity and Magnetism – Berkeley Physics Course, Vol. 2, Tata McCraw-Hill ,2007. Gopal S., Engineering Physics, Inder Publications, Coimbatore, 2006. Gopal S., Engineering Physics, Inder Publications, Coimbatore, 2006.
8. Gopal S., Engineering Physics, Inder Publications, Coimbatore, 2006.

U17 CHT1001 Chemistry for Automobile Engineering

L	T	P	J	C
3	0	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Discuss Basic concepts of electrochemistry involved in battery assembly (K2)
CO2: Apply the principle of electrochemistry and assemble a battery (K4)
CO3: Defend the Corrosion problems (K2)
CO4: Summarize different types of fuels and lubricants (K2)
CO5: Discuss basic concepts of combustion (K3)
CO6: Outline the principles and instrumentation of spectroscopic techniques involved in material characterization (K2)

Pre-requisites :

NIL

CO/PO Mapping (S/M/W indicates strength of correlation)S-Strong, M-Medium, W-Weak												
COs	Programme Outcomes(POs)											
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	M					M						
CO2	S											
CO3	M	M				M						
CO4	M		M			M						
CO5	S											
CO6	M											

Course Assessment methods

Direct
1. Continuous Assessment Test I, II 2. Open book test; Cooperative learning report, Assignment; Journal paper review, Group Presentation, Project report, Poster preparation,Prototype or Product Demonstrationetc (as applicable) 3. End Semester Examination
Indirect
1. Course-end survey

ELECTROCHEMISTRY 9 Hours

Introduction - Electrode potential - Nernst equation and problems - Electrochemical series - Application of EMF measurements and problems - Kohlrausch law of independent migration of ions and its application.

Electrodes: Standard and Reference electrode (Hydrogen and Calomel) - Types of electrodes (Metal - Metal ion; Metal - Metal insoluble salt, Redox electrode) - Ion selective (glass electrode) - Determination of pH, pO_2, pCO_2 - Classification of electrochemical cell.

CORROSION SCIENCE 6 Hours

Corrosion: Principles and Mechanism of electrochemical corrosion - Factors influencing corrosion.

Types of corrosion: Galvanic corrosion - Differential aeration corrosion (pitting corrosion, water line corrosion) - Stress corrosion.

Corrosion control: Inhibitors - Dehumidifier gels - Cathodic protection (sacrificial anode) - Plating Techniques: Plating - Need for plating - Electroforming -Electropolishing - Electrochemical machining - Electrophoretic painting.

ENERGY STORING DEVICES 12Hours

Batteries: Factors for selection of batteries - Rating calculation using datasheet.
Primary Battery (Alkaline battery) - Secondary Battery (Lead acid storage battery, Nickel - Cadmium battery, Lithium ion battery and Lithium polymer battery) - Nuclear battery - Nano Battery
Flow battery: Introduction - Construction of Types of fuel cell
Solar Cells: Silicon Solar cells - Hybrid Solar cells - Dye sensitized solar cells - Tandem Solar cells.

FUELS: COMBUSTION AND LUBRICANTS 9 Hours

Fuels: Classification of fuels - Liquid Fuel: Manufacturing of synthetic petrol (Fischer Tropsch method)
Gaseous fuels: Production, composition and uses of producer gas, water gas and natural gas.
Combustion: Gross and net calorific value - Explosive range - Calculation of minimum amount of air for combustion - Spontaneous ignition temperature - Flue gas analysis (Orsat apparatus).
Lubricants: Classification - Functions - Properties (viscosity index, flash and fire point, oiliness, carbon residue, aniline point, cloud and pour point) - Semi solid lubricant (greases with calcium based, sodium based, lithium based) - solid lubricants (graphite, molybdenum disulphide).

SPECTROCHEMICAL TECHNIQUES IN MATERIAL CHARACTERISATION 9 Hours

Introduction to spectroscopy - Beer Lambert's Law.
Principle, instrumentation (block diagram only) and applications of : Colorimetric analysis (Estimation of concentration of Ferrous and copper ions in solutions), IR spectroscopy, Flame photometry, XRD, SEM.

Theory: 45	**Tutorial: 0**	**Practical: 0**	**Project: 0**	**Total: 45 Hours**

REFERENCES

1. Atkins, P. and de Paula, J. Atkins, Physical Chemistry, 9th ed., Oxford Univ. Press, 2009.
2. Glasstone S., An introduction to Electrochemistry, 10th Edition, Affiliated to East West Press Private Limited, 2007.
3. Derek Pletcher and Frank C Walsh., Industrial Electrochemistry, Blackie Academic and Professional, London, 1993
4. Ahmed Z., Principles of corrosion engineering and corrosion control, Butterworth Heinemann, 2006.
5. David Linden & Thomas B. Reddy., Handbook of Batteries, 3rd edition, McGraw-Hill Companies, Inc. 2001
6. Revankar S.T., Majumdar P., Fuel Cell: Principles, Design and Analysis, CRC Press, 2014.
7. Samir Sarkar., Fuels and Combustion, 3rd Edition , Orient Longman, India, 2009.
8. Jain P.C. and Jain. M., Engineering Chemistry, 16th Edition, Dhanpat Rai Publishing Company, New Delhi, Reprint 2013.
9. Dara S.S. and Umare S.S., A text book of Engineering Chemistry, S.Chand and Company Limited, New Delhi, 2014.
10. Syed Shabudeen, P.S. and Shoba U.S., Engineering Chemistry, Inder Publishers, Coimbatore, 2013

11. Sharma Y.R., Elementary Organic Spectroscopy, 5th Revised Edition, S.Chand and Company Limited, New Delhi, 2013.

U17MET1101 ENGINEERING GRAPHICS

L	T	P	J	C
2	1	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Construct various plane curves.
C02: Construct projection of points and projection of lines.
CO3: Develop projection of surfaces and solids.
CO4: Solve problems in sections of solids and development of surfaces.
CO5: Apply the concepts of isometric, and perspective projections
CO6: Apply free hand sketching in engineering practice.

Pre-requisites :

Nil

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	M										
CO2	S	S									W	
CO3	S	S									M	
CO4	S	S										
CO5	S											
CO6	S											

Course Assessment methods

Direct

1. Continuous Assessment Test I, II (Theory component)
2. Open book test; Cooperative learning report, Assignment; Journal paper review, Group Presentation, Project report, Poster preparation, Prototype or Product Demonstration etc (as applicable) (Theory component)
3. Pre/Post - experiment Test/Viva; Experimental Report for each experiment (lab component)
4. Model examination (lab component)
5. End Semester Examination (Theory and lab component)

Indirect

1. Course-end survey

PLANE CURVES, PROJECTION OF POINTS AND LINES 6+3 Hours

Importance of graphics in design process, visualization, communication, documentation and drafting tools, Construction of curves - ellipse, parabola, and hyperbola by eccentricity method only. Orthographic projection of points.
Projections of straight lines located in first quadrant - determination of true length and true inclinations.

PROJECTIONS OF SURFACES AND SOLIDS 6+3 Hours

Projections of plane surfaces - polygonal lamina and circular lamina, located in first quadrant and inclined to one reference plane. Projection of simple solids - prism, pyramid, cylinder and cone. Drawing views when the axis of the solid is inclined to one reference plane.

SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES 6+3 Hours

Sectioning of simple solids - prisms, pyramids, cylinder and cone. Obtaining sectional views and true shape when the axis of the solid is vertical and cutting plane inclined to one reference plane.
Development of lateral surfaces of truncated prisms, pyramids, cylinders and cones.

PICTORIAL PROJECTIONS 6+3 Hours

Isometric projection, Isometric scale, Isometric views of simple solids, truncated prisms, pyramids, cylinders and cones.
Perspective projection of prisms and pyramids when its base resting on the ground by vanishing point method.

FREE-HAND SKETCHING 6+3 Hours

Free hand sketching techniques, sketching of orthographic views from given pictorial views of objects, including free-hand dimensioning.
Sketching pictorial views from given orthographic views.

Theory: 30	**Tutorial: 15**	**Practical: 0**	**Project: 0**	**Total: 45 Hours**

REFERENCES

1. Bhatt ND, Engineering Drawing, Charotar Publishing house, 54th edition, 2014.
2. Venugopal K. and Prabhu Raja V., Engineering Graphics, New Age International (P) Limited, New Delhi, 2016.
3. Nataraajan K.V., Engineering Drawing and Graphics, Dhanalakshmi Publisher, Chennai, 2006.
4. Basant Agrawal and Agrawal C.M, Engineering Drawing and Graphics,McGraw Hill Edition(India), 2013.
5. Gopalkrishna K.R., Engineering Drawing (Vol. I & II), Subhas Publications, 2014.

U17CSI1211 **Structured Programming using C**

L	T	P	J	C
3	0	2	0	4

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Explain the basics of problem solving techniques

CO2: Select appropriate data types and control structures for solving a given problem

CO3: Illustrate the representation of arrays, strings and usage of string operations

CO4: Illustrate the importance of pointers and functions

CO5: Explain the fundamentals of structures and unions

CO6: Explain the fundamentals of file handling

Pre-requisite: Nil

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	M										
CO2	S	M										
CO3	S	L			L				L	L		
CO4	M	L			L				L	L		M
CO5	M	L			L				L	L		M
CO6	L	L										

Course Assessment methods:

Direct

1. Continuous Assessment Test I, II (Theory Component)
2. Assignment (Theory Component)
3. Group Presentation (Theory Component)
4. Pre/Post - experiment Test/Viva; Experimental Report for each experiment (lab component)
5. Model examination (lab component)
6. End Semester Examination (Theory and lab component)

Indirect

1. Course-end survey

Theory Component contents

FUNDAMENTALS OF PROBLEM SOLVING **9 Hours**

Programs and Programming – Classification of Programming Languages based on Generations – Structured Programming Concept – Algorithm – Flowchart – Pseudo code

STRUCTURED PROGRAMMING **9 Hours**

Introduction to C Programming – Operators and Expressions – Data Input and Output – Control Statements

ARRAYS AND STRINGS **9 Hours**

Defining an array – Processing an array – Passing arrays to functions –Multidimensional Arrays

Defining a string – NULL character – Initialization of Strings – Reading and Writing Strings – Processing Strings – Character Arithmetic – Searching and Sorting of Strings – Library functions for strings

FUNCTIONS, STORAGE CLASSES AND POINTERS **9 Hours**

Defining a function – Accessing a function – Function prototypes – Passing arguments to a function – Recursion – Storage classes – Pointer Fundamentals – Pointer Declaration – Passing Pointers to a Function – Pointers and one dimensional arrays – operations on pointers – Dynamic memory allocation

STRUCTURES, UNIONS AND FILES **9 Hours**

Structures and Unions: Defining a Structure – Processing a Structure – User defined data types (Typedef) – Unions

Files: Opening and Closing a Data File – Reading and writing a data file – Processing a data file – Unformatted data files – Concept of binary files – Accessing a file randomly using fseek

Theory: 45 hours	**Tutorial:0 hours**	**Practical:0 hours**	**Total Hours: 45 hours**

REFERENCES

1. Byron S Gottfried and Jitendar Kumar Chhabra, "Programming with C", Tata McGraw Hill Publishing Company, Third Edition, New Delhi, 2011.
2. PradipDey and ManasGhosh, "Programming in C", Second Edition, Oxford University Press, 2011.
3. Kernighan,B.W and Ritchie,D.M, "The C Programming language", Second Edition, Pearson Education, 2006
4. Ashok N. Kamthane, "Computer programming", Pearson Education, 2007.

Lab Component

List of Experiments **30 Hours**

1. Writing algorithms, flowcharts and pseudo codes for simple problems.
2. Programs on expressions and conversions
3. Programs using if, if-else, switch and nested if statements
4. Programs using while, do-while, for loops
5. Programs on one dimensional arrays, passing arrays to functions and array operations
6. Programs using two dimensional arrays, passing 2D arrays to functions
7. Programs using String functions
8. Programs using function calls, recursion, call by value
9. Programs on pointer operators, call by reference, pointers with arrays
10. Programs using structures and unions.
11. Programs on file operations and modes.
12. Working with text files, random files and binary files

Theory: 0	**Tutorial: 0**	**Practical: 30**	**Project: 0**	**Total: 30 Hours**

REFERENCES

1. Byron S Gottfried and Jitendar Kumar Chhabra, “Programming with C”, Tata McGraw Hill Publishing Company, Third Edition, New Delhi, 2011.

2. PradipDey and ManasGhosh, “Programming in C”, Second Edition, Oxford University Press, 2011.
3. Kernighan,B.W and Ritchie,D.M, “The C Programming language”, Second Edition, Pearson Education, 2006
4. Ashok N. Kamthane, “Computer programming”, Pearson Education, 2007.

U17PHP1501	Physics laboratory (Common to AE, AU, BT, CE, CS, IT, MC,TX)	L	T	P	J	C
		0	0	2	0	1

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Determine different physical properties of a material like thermal conductivity, thickness of the material.

CO2: Perform experiments involving the physical phenomena like interference and diffraction

CO3: Apply physical theories in real life situations by also taking into account its limitation.

Pre-requisites :

NIL

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S											
CO2		M	S									
CO3		S		M								

Course Assessment methods

Direct
1. Pre-or Post-experiment Test/Viva; Experimental Report for each experiment; Model Examination 2. End Semester Examination
Indirect
1. Course-end survey

List of Experiments **30 Hours**

1. Determine thermal conductivity of the given cardboard by Lee's disc method.
2. Determine the thickness of a thin sheet by air wedge method.
3. Determine the co-efficient of viscosity of the given liquid by Poiseuille's flow method.
4. Determine the value of acceleration due to gravity by compound pendulum.
5. Calculate the solar panel efficiency by using lux meter.
6. Determine the wavelengths of the violet, blue, green and yellow in mercury spectrum using spectrometer grating method (the green spectral line for which the wavelength is 5461 A^0).
7. Determine Young's modulus of the given bar using non-uniform bending method.
8. Calculate the frequency of the given tuning fork by longitudinal and transverse mode of vibrational methods.
9. Determine the velocity of ultrasonic sound and compressibility of the given liquid by using ultrasonic interferometer.
10. By using semiconductor laser determine: i) Wavelength of LASER using grating. ii) Acceptance angle & numerical aperture of optical fiber (grating element: N=5,00,000 lines/meter).

Theory: 0	**Tutorial: 0 Practical: 30**	**Project: 0**	**Total: 30 Hours**

REFERENCES

1. Laboratory Manual of Engineering Physics by Dr. Y. Aparna & Dr. K. Venkateswara Rao (V.G.S Publishers)
2. "Practical Physics", G.L. Squires, Cambridge University Press, Cambridge, 1985. 11. 12.
3. "Great Experiments in Physics", M.H. Shamos, Holt, Rinehart and Winston Inc., 1959.
4. "Experiments in Modern Physics", A.C. Melissinos, Academic Press, N.Y., 1966. Gupta S.C, and Kapur, J.N.

U17MEP1501	ENGINEERING PRACTICES LABORATORY	L	T	P	J	C
		0	0	2	0	1

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Select the various tools and equipment's used in the fabrication workshop.
CO2: Develop various models in carpentry and fitting
CO3: Make components using sheet metal work.
CO4: Select the various tools and joints for different applications in plumbing.
CO5: Demonstrate and evaluate the parameters of basic electronic components (wires, resistors, capacitors, diodes etc.) and test the components.
CO6: Estimate DC and AC Voltage and currents using appropriate measuring instruments.

Pre-requisites :

Nil

	CO-PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs	Programme Outcomes(POS)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S											
CO2					M							
CO3			M									
CO4						W						
CO5	M											
CO6	M											

Course Assessment methods

Direct
1. Pre-or Post-experiment Test/Viva; Experimental Report for each experiment; Comprehensive report / Model Examination 2. End Semester Examination
Indirect
1. Course-end survey

List of Experiments **30 Hours**

GROUP – I

A. CIVIL ENGINEERING

1. Carpentry
   - Study of carpentry tools
   - Preparation of T joint
   - Preparation of dovetail joint

2. Plumbing
   - Study of pipeline joints

B. MECHANICAL ENGINEERING

1. Fitting
   - Study of fitting tools

- Preparation of L joint
- Preparation of square joint

2. Sheet Metal Working
   - Study of sheet metal working tools
   - Preparation of cone
   - Preparation of tray

GROUP - II (ELECTRICAL & ELECTRONICS ENGINEERING)
C. ELECTRICAL ENGINEERING PRACTICE

1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lamp wiring.
3. Stair-case wiring.
4. Measurement of electrical quantities–voltage, current, power & Power factor in RLC circuit.
5. Measurement of energy using single phase energy meter.

D. ELECTRONIC ENGINEERING PRACTICE

1. Testing of Electronic components and Measurements using a digital multimeter.
2. Study of CRO and Function generator.
3. PCB Design and Fabrication.
4. Soldering simple electronic circuits and checking continuity

Theory: 0	**Tutorial: 0**	**Practical: 30**	**Project: 0**	**Total: 30 Hours**

U17VEP1501 **PERSONAL VALUES**

L	T	P	J	C
0	0	2	0	1

Course Outcomes

After successful completion of this course, the students should be able to

CO 1: Become an individual in knowing the self
CO 2 : Acquire and express Gratitude, Truthfulness, Punctuality, Cleanliness & fitness.
CO 3: Practice simple physical exercise and breathing techniques
CO 4: Practice Yoga asana which will enhance the quality of life.
CO 5: Practice Meditation and get benefited.
CO 6: Procure Self Healing techniques for propagating healthy society

Pre-requisites : NIL

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												M
CO2										S		
CO3						M						
CO4						S			M			
CO5										M		
CO6								W				S

Course Assessment methods

Direct
1. Group Activity / Individual performance and assignment 2. Assessment on Value work sheet / Test
Indirect
1. Mini project on values / Goodwill Recognition

Values through Practical activities: **30 hours**

1.Knowing the self : Introduction to value education - Need & importance of Value education – Knowing the self – realization of human life – animal instinct vs sixth sense.

2. Mental Health : Evolution of senses – functioning steps of human mind – Body and Mind coordination - Analysis of thoughts – moralization of desires– autosuggestions – power of positive affirmations. – Meditation and its benefits.

3.Physical Health: Physical body constitution– Types of food - effects of food on body and mind – healthy eating habits – food as medicine– self healing techniques.

4.Core value : Self love& Self care Gratitude - Happiness - Optimistic –Enthusiasm – Simplicity – Punctual - Self Control - Cleanliness & personal hygiene - Freedom from belief systems.

5.Fitness: Simplified physical exercises – Sun salutation - Lung strengthening practices: Naadi suddhi pranayama – Silent sitting and listening to nature – Meditation.

Theory: 0	Tutorial: 0	Practical: 30	Project: 0	Total: 30 hours

REFERENCES

1. KNOW YOURSELF — SOCRATES – PDF format at www.au.af.mil/au/awc/awcgate/army/rotc_self-aware.pdf

2. STEPS TO KNOWLEDGE: The Book of Inner Knowing – PDF format at www.newmessage.org/wp-content/uploads/pdfs/books/STK_NKL_v1.5.pdf

3. PROMOTING MENTAL HEALTH - World Health Organization – PDF format at www.who.int/mental_health/evidence/MH_Promotion_Book.pdf

4. LEARNING TO BE: A HOLISTIC AND INTEGRATED APPROACH TO VALUES – UNESCO PDF format at www.unesdoc.unesco.org/images/0012/001279/127914e.pdf

5. PERSONALITY DEVELOPMENT By SWAMI VIVEKANANDA www.estudantedavedanta.net/Personality-Development.pdf

Semester 2

U17MAT2101	Advanced Calculus and Laplace Transforms (Common to AE, AUE, CE, MCE, ME)	L	T	P	J	C
		3	1	0	0	4

Course Outcomes

After successful completion of this course, the students should be able to:

CO1 : Evaluate multiple integrals and apply them to find area, moment of inertia, centre of mass and volume

K3

CO2 : Apply various vector differential operators and integral theorems for solving Engineering problems involving cubes and rectangular parallelepipeds.

K4

CO3 : Construct analytic functions of complex variables and transform functions from z-Plane and w-plane and vice-versa, using conformal mappings

K4

CO4 : Use the fundamentals of residues, complex integration to evaluate real integrals

K3

CO5 : Transform functions in time domain to frequency domain using Laplace transform

K4

CO6 : Convert ordinary differential equations into algebraic equations using Laplace Transform and solve them using inverse Laplace transform

K4

Pre-requisites :

Nil

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	S							M	M		M
CO2	S	S							M	M		M
CO3	S	S							M	M		M
CO4	S	S							M	M		M
CO5	S	S							M	M		M
CO6	S	S							M	M		M

Course Assessment methods

Direct
1. Continuous Assessment Test I, II 2. Open book test; Cooperative learning report, Assignment; Journal paper review, Group Presentation, Project report, Poster preparation, Prototype or Product Demonstration etc. (as applicable) 3. End Semester Examination
Indirect
1. Course-end survey

MULTIPLE INTEGRALS **9 + 2 Hours**

Double integration – Cartesian and polar coordinates – Change of order of integration – Change of variables between cartesian and polar coordinates - Triple integration in cartesian coordinates – Application : Area as double integral –- Moment of inertia - Centre of mass - Volume as triple integral.

VECTOR CALCULUS **9 + 3 Hours**

Gradient, divergence and curl – Directional derivative – Irrotational and solenoidal vector fields - Green's theorem in a plane, Gauss divergence theorem and Stoke's theorem (excluding proofs) – Simple applications involving cubes and rectangular parallelepipeds.

ANALYTIC FUNCTION **9 + 3 Hours**

Functions of a complex variable – Analytic functions – Necessary conditions, Cauchy-Riemann equations in Cartesian coordinates and sufficient conditions (excluding proofs) – Properties of analytic function – Construction of analytic function by Milne Thomson method – Conformal mapping : $w = z + c$, cz , $1/z$ and bilinear transformation.

COMPLEX INTEGRATION **9 + 2 Hours**

Statement and applications of Cauchy's integral theorem and Cauchy's integral formula (excluding proofs) – Taylor's and Laurent's series expansions – Singularities – Residues – Cauchy's residue theorem (excluding proof) – Application of residue theorem to evaluate real integrals - Unit circle and semi-circular contours (excluding poles on real axis).

LAPLACE TRANSFORM **5 +3 Hours**

Definition - Properties – Superposition - Shift in t - Shift in s - Time Derivatives - Time Integral – Initial and Final Value Theorems – Periodic functions: sine wave, saw-tooth, square and triangular waves

INVERSE LAPLACE TRANSFORM **4 +2 Hours**

Inverse Laplace Transform – Simple system dynamic models – Transfer Functions – Poles and Zeroes - Response of First-Order Systems - Solution of RC Free, Step and Sinusoidal Responses; Response of Second-Order Systems - Free Response, step Response - Convolution theorem.

Theory: 45 Tutorial: 15 Practical: 0 Project: 0 Total : 60 Hours

REFERENCES

1. Kreyzig E., Advanced Engineering Mathematics, John Wiley & Sons (Asia), Pvt, Ltd., Singapore, 10th Edition, 2010
2. Grewal B.S., Higher Engineering Mathematics, Khanna Publishers, Delhi, 42nd Edition, 2012.
3. Philip D. Cha, James J. Rosenberg, Clive L. Dym, Fundamentals of Modelling and Analyzing Engineering Systems, Cambridge University Press, United Kingdom, 2000.
4 Veerarajan T., Engineering Mathematics (for First Year), Tata McGraw Hill, Pub. Co. Ltd., New Delhi, Revised Edition, 2007.
5 Venkataraman M.K., Engineering Mathematics, Volume - II, The National Pub. Co., Chennai, 2003.
6 Kandasamy P., Thilagavathy K. and Gunavathy K., Engineering Mathematics, S. Chand & Co., New Delhi, 2008.
7 Arunachalam T. and Sumathi K., Engineering Mathematics II, Sri Vignesh Publications, Coimbatore, Third Edition, 2011.
8 Weir .MD, Hass J, Giordano FR: Thomas Calculus Pearson education 12th ED, 2015.
9 N.P.Bali., Dr. Manish Goyal., ―Transforms and partial Differential equations, University science Press, New Delhi, 2010.

E books and online learning materials

(1) Advanced Engineering Mathematics, P. V. O'Neil, 5th Indian reprint 2009, Cengage Learning India Pvt. Ltd.

(2) Advanced Engineering Mathematics, Dennis Zill Warren S Wright Michael R. Cullen, 4th edition, 2011, Jones & Bartlett Learning.

Online Courses and Video Lectures:
http://nptel.ac.in/course.php?disciplineId=111
www.mathworld.wolfram.com

U17PHT2002 Material Science for Automobile Engineering

L	T	P	J	C
3	0	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Recognize the core concepts of conducting materials.
CO2: Perceive the preambles, types of semiconductors and to conceive the Hall effect along with its applications
CO3: Categorize the magnetic materials based on their properties.
CO4: Elucidate the basics of superconductors and its applications
CO5: Understand the mechanism of dielectrics and its engineering applications.
CO6: Confer the properties, preparation and applications of new engineering materials and nano materials.

Pre-requisites :

NIL

CO/PO Mapping
(S/M/W indicates strength of correlation)S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	S	M										M
CO2	S	M										M
CO3	S	M										M
CO4	S	M										M
CO5	S	M			M							M
CO6	S	M										M

Course Assessment methods

Direct
1. Continuous Assessment Test I, II 2. Cooperative learning report, Assignment; Group Presentation, Project report, Poster preparation 3. End Semester Examination
Indirect
1. Course-end survey

CONDUCTING MATERIALS 9 Hours

Classical free electron theory of metals-electrical conductivity – thermal conductivity - expression – Wiedemann Franz law(derivation) – Lorentz number – drawbacks of classical

theory – Fermi distribution function – density of energy states – effect of temperature on Fermi energy.

SEMICONDUCTING MATERIALS **9 Hours**

Origin of band gap in solids (qualitative treatment only) - carrier concentration in an intrinsic semi conductor (derivation) – Fermi level – variation of Fermi level with temperature - electrical conductivity – band gap semiconductor –extrinsic semiconductor(Qualitative only) – variation of Fermi level with temperature and impurity concentration – Hall effect – determination of Hall coefficient – experimental set up – applications.

MAGNETIC AND SUPERCONDUCTING MATERIALS **9 Hours**

Magnetic materials: Properties of dia, para, ferro, anti-ferro and ferri magnetic materials – domain theory of ferromagnetism - hysteresis – soft and hard magnetic materials – ferrites – applications.

Superconducting materials: Superconducting phenomena – properties of superconductors – Meissner effect, isotopic effect. Type I &Type II superconductors – high Tc superconductors- applications: cryotron, magnetic levitation and squids.

DIELECTRIC MATERIALS **9 Hours**

Electronic, ionic, orientation and space charge polarization - frequency and temperature dependence of polarization – dielectric loss –Internal field – Classius - Mossotti relation– dielectric breakdown – different types of break down mechanism - ferro electric materials - properties and applications.

NEW ENGINEERING MATERIALS AND NANO TECHNOLOGY **9 Hours**

New engineering materials: metallic glasses – preparation, properties and applications – shape memory alloys (SMA) – characteristics- properties of NiTi alloy applications, advantages and disadvantages of SMA.

Nano materials: synthesis – chemical Vapour deposition – sol – gel, electro deposition— ball milling –properties of nano particles and applications – carbon nano tubes – fabrication method – pulsed laser deposition – structure, properties and applications.

Theory: 45	**Tutorial: 0**	**Practical: 0**	**Project: 0**	**Total: 45 Hours**

REFERENCES

1. Pillai S.O., Solid State Physics, 5th edition, New Age International Publication, New Delhi, 2003.

2. Gaur R.K. and Gupta S.L., Engineering Physics, 8th edition, Dhanpat Rai Publications (P) Ltd., New Delhi, 2003.
3. William D CallisterJr, ―Materials Science and Engineering-An Introduction‖, John Wiley and Sons Inc., Sixth Edition, New York, 2010.
4. Van Vlack, ―Elements of Material Science and Engineering‖, Pearson Education India, 2008.
5. Raghavan V. Materials Science and Engineering, Prentice Hall of India Pvt. Ltd., 1999
6. Rajendran V. and Marikani A., Materials science, 5th edition, Tata Mc-Graw-Hill publishing company Ltd., 2004
7. James F Shackelford S, ―Introduction to Materials Science for Engineers‖, Third Edition, Macmillan Publishing Company, New York. 1992
8. Gopal S., Materials Science, Inder Publications, Coimbatore, 2007.

U17 CHT2001 Metallurgical Chemistry for Automobile

L	T	P	J	C
3	0	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Construct a phase diagram (K3)
CO2: Discuss the constitution of alloys and categorize the alloys (K2)
CO3: Discuss the applications of ferrous alloys based on their properties (K3)
CO4: Discuss the applications of Non-ferrous materials based on their properties (K3)
CO5: Outline about the non-metallic materials (K2)
CO6: Discuss the heat treatment techniques and apply in real life situation (K3)

Pre-requisites :

NIL

CO/PO Mapping (S/M/W indicates strength of correlation)S-Strong, M-Medium, W-Weak												
COs	Programme Outcomes(POs)											
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	M					M						
CO2	S											
CO3	M	M				M						
CO4	M		M			M						
CO5	S											
CO6	M											

Course Assessment methods

Direct
1. Continuous Assessment Test I, II 2. Open book test; Cooperative learning report, Assignment; Journal paper review, Group Presentation, Project report, Poster preparation,Prototype or Product Demonstrationetc (as applicable) 3. End Semester Examination
Indirect
1. Course-end survey

CONSTITUTION OF ALLOYS AND PHASE DIAGRAMS 9 Hours

Constitution of alloys - Solid solutions, substitutional and interstitial - Phase rule - condensed phase rule - Construction of phase diagram (thermal analysis) - Applications of phase rule: Simple eutectic system (Ag - Pb, Fe - C system) - Isomorphism, eutectic, peritectic, eutectoid and peritectoid reactions.

FERROUS AND NON-FERROUS MATERIALS AND ALLOYS 12 Hours

Composition, structure and properties of

Carbon steels : low alloy steels - stainless steels - tool steels

Cast irons : Grey iron, ductile iron, white iron and malleable iron

Non-ferrous alloys : Copper alloys -Aluminum alloys - Magnesium alloys - Nickel alloys and Titanium alloys.

NON-METALLIC MATERIALS 9Hours

Polymeric materials - Formation of polymer structure - Properties, processing and applications of engineering polymers: Advanced structure ceramics- WC-TiC- Al_2O_3 - SiC - Si_2N_4, CBN, Diamond and composites.

ELECTRICAL & THERMAL PROPERTIES OF MATERIALS 6 Hours

Electrical conduction - Semi conductivity - Super conductivity - Electrical conduction in ionic ceramics and in polymers - Dielectric behavior- Ferroelectricity- Piezoelectricity - Heat capacity - Thermal expansion - Thermal conductivity -Thermal stresses.

HEAT TREATMENT 9 Hours

Definition - Annealing, types - normalizing, hardening and Tempering of steel - Isothermal transformation diagrams - cooling curves superimposed on I.T. diagram CCR - Harden ability, Jominy end quench test - Austempering – Martempering - Case hardening - types.

Theory: 45	**Tutorial: 0**	**Practical: 0**	**Project: 0**	**Total: 45 Hours**

REFERENCES

1. Williams D Callister, Material Science and Engineering, Revised Indian edition, Wiley India Pvt Ltd, 2007
2. Upadhyay. G.S. and AnishUpadhyay, Materials Science and Engineering, Viva Books Pvt.Ltd., New Delhi, 2006.
3. Raghavan.V, Materials Science and Engineering, Prentice Hall of India Pvt. Ltd., 1999.
4. Kenneth G.Budinski and Michael K. Budinski, Engineering Materials, 4 th Indian Reprint, Prentice Hall of India Private Limited, 2002.
5. Avner, S.H., Introduction to Physical Metallurgy, McGraw Hill Book Company, 2017.
6. U.C. Jindal : Material Science and Metallurgy, Engineering Materials and Metallurgy, First Edition, Dorling Kindersley, 2012

U17MET2102 ENGINEERING MECHANICS

L	T	P	J	C
3	1	0	0	4

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Explain the concept of equilibrium of particles subjected to concurrent forces.

CO2: Determine the reactions in different types of support and loading conditions.

CO3: Estimate the moment of inertia for various shapes and sections.

CO4: Make use of various concepts of friction.

CO5: Solve problems using the concepts in kinematics

CO6: Solve problems in kinetics.

Pre-requisites :

Nil

	CO-PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs	**Programme Outcomes(POS)**											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S											
CO2		S										
CO3		S										
CO4		M										
CO5	S											
CO6	S											

Course Assessment methods

Direct
1. Continuous Assessment Test I, II 2. Open book test; Cooperative learning report, Assignment; Journal paper review, Group Presentation, Project report, Poster preparation,Prototype or Product Demonstration etc (as applicable) 3. End Semester Examination
Indirect
1. Course-end survey

BASICS & STATICS OF PARTICLES **12 Hours**

Introduction - Units and Dimensions - Laws of Mechanics Lame's theorem, Parallelogram and triangular Laws of forces – Coplanar Forces - Resolution and Composition of forces – Free body diagram - Equilibrium of a particle.

EQUILIBRIUM OF RIGID BODIES **12 Hours**

Moment of a force about point – Varignon s theorem- Moment of a couple-Resolution of force in to force couple system-Resultant of coplanar non concurrent system - Types of supports and

their reactions- Requirements of stable equilibrium - Equilibrium of Rigid bodies in two dimensions.

PROPERTIES OF SURFACES AND SOLIDS **12 Hours**

First moment of area and the Centroid of sections Rectangle, circle, triangle, T section, I section Angle section and Hollow section. Second and product moments of plane area Rectangle, triangle, circle. T Section, I section, Angle section and Hollow section, Parallel axis theorem and perpendicular axis theorem - Polar moment of inertia.

FRICTION **12 Hours**

Frictional force-Law of coulomb friction, simple contact friction, Rolling resistance and Belt friction, Ladder friction, Wedge friction.

DYNAMICS OF PARTICLES **12 Hours**

Kinematics: Rectilinear & Curvilinear motion of particles, Displacements Velocity and acceleration.
Kinetics: Newton's law, Work Energy method, Impulse and Momentum, Impact of elastic bodies.

Theory: 45	**Tutorial: 15**	**Practical:**	**Project: 0**	**Total: 60 Hours**

REFERENCES

1. Beer F.P. and Johnson Jr. E.R., Vector Mechanics for Engineers, Vol. I Statics and Vol. II Dynamics, McGraw-Hill International Edition, 2004
2. Hibbeller, R.C., Engineering Mechanics, Vol. I Statics and Vol. II Dynamics, Pearson Education, Asia Pvt. Ltd., 2000.
3. Ashok Gupta, Interactive Engineering Mechanics Statics A Virtual Tutor, Pearson Education, Asia Pvt. Ltd., New Delhi, 2002.
4. Palanichamy M.S., and Nagan S., Engineering Mechanics (Statics & Dynamics) Tata McGraw Hill, 2001.
5. Irving H. Shames, Engineering Mechanics – Statics and Dynamics, IV Edition, Pearson Education, Asia Pvt. Ltd., 2003.
6. Sukumar T.R. and Sridhar S., Engineering Mechanics, Inder Publications, Coimbatore.

U17EET2013	INTRODUCTION TO ELECTRICAL AND ELECTRONICS ENGINEERING	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to:

CO1: Acquire the fundamental knowledge of Electric circuits and semiconductor devices
CO2: Select a suitable semiconductor device for specific application
CO3: Understand the functionality of Op-amps and gates
CO4: Understand the construction, working principle, characteristics and applications of motors
CO5: Apply the fundamental laws of magnetic circuits to electrical motors
CO6: Choose a suitable motor for desired application

Pre-requisites : Nil

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S				W							
CO2	S	M										
CO3	M											
CO4		M		M								
CO5	M				W							

Course Assessment methods

Direct
1. Continuous Assessment Test I, II 2. Open book test; Cooperative learning report, Assignment; Journal paper review, Group Presentation, Project report, Poster preparation, Prototype or Product Demonstration etc (as applicable) 3. End Semester Examination
Indirect
1. Course-end survey

ELECTRIC CIRCUITS FUNDEMENTALS **8 Hours**

(Qualitative Treatment Only)

Ohm's law, Kirchoff's law, Passive elements.

Introduction to DC voltage: Relation between Voltage, Current, Resistance and Power in Resistance, Inductance and Capacitance. Energy stored in the passive elements.

Introduction to AC voltage: Alternating quantity, cycle, time period, frequency and average and RMS value, Relation between Voltage, Current, Resistance and Power in ac circuits. Energy stored in the passive elements.

Electromagnetism: Magnetic flux, Flux density, Permeability, Field intensity, –Faraday's laws of Electromagnetic Induction – Self-inductance and Mutual inductance, Fleming's rule

LOW POWER SEMICONDUCTOR DEVICES **7 Hours**

(Qualitative Treatment Only)

Symbol, operation and V-I Characteristic and types of Semiconductor diode - Zener diode- photo diode - light emitting diode, Bipolar Junction transistors, JFET, MOSFET

HIGH POWER SEMICONDUCTOR DEVICES: 7 Hours
(Qualitative Treatment Only)
Symbol, operation and V-I Characteristic of Power diodes, Power Bipolar Junction transistors –Power MOSFET, IGBT, SCR. Comparison of power semiconductor devices.

INTEGRATED CIRCUITS (Qualitative Treatment Only) 8 Hours
Analog Electronics: Operational amplifiers, Ideal op-amp, adder, subtractor, amplifiers – inverting, non-inverting and differential amplifiers, Integrator, Differentiator.
Binary logic gates: – AND, OR, NOT, Universal gates, Introduction to Boolean algebra, Multiplexers, De-multiplexers, Encoders, Decoders.

ELECTRICAL MOTORS (Qualitative Treatment Only) 8 Hours
DC motor: Types of motors, Principle of operation – Back-emf and voltage equation – Torque and speed Characteristics of Series, Shunt and compound motors
Transformer: Ideal Transformer, transformation ratio, Emf equation, Applications
Ac motors: Single phase induction motor, Three phase induction motor – Cage rotor and Wound rotor – Principle of operation – Torque Slip characteristics

SPECIAL MACHINES: (Qualitative Treatment Only) 7 Hours
Introduction, Stepper motor, Types of stepper motor, Permanent Magnet DC motor, to Brushless DC motor, Switched Reluctance Motor, Servo motor, Selection of motor for automotive applications

Theory: 45 Tutorial: 0 Practical: 0 Project: 0 Total: 45 Hours

REFERENCES

1. Muthusubramanian R., Salivahanan S. and Muraleedharan. K.A., Basic Electrical Electronics and Computer Engineering, Tata Mcgraw Hill, II edition, 2006.
2. Thyagarajan T., Sendur Chelvi K.P. and Rangaswamy T.R., Engineering Basics: Electrical, Electronics and Computer Engineering, Revised II edition, New Age International Pvt. Ltd., 2007
3. Thomas L Floyd, Electronic Devices, 6th edition, Pearson Education, 2003.
4. Roy Choudhury D., Shail B Jain, Linear Integrated Circuits, II Edition, New Age International, 2003
5. Theraja B.L., Fundamentals of Electrical Engineering and Electronics, S. Chand Publishing, 2012.
6. Sen P. C., Principles of Electric Machines and Power Electronics, III Edition, Wiley Global Education, 2013

U17CHP2501	Chemistry Laboratory (COMMON TO AE, AU, BIO, CE & MCE)	L	T	P	J	C
		0	0	2	0	1

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Prepare standard solutions (S1)

CO2: Analyse the properties of water by applying the chemical concepts (S2)

CO3: Analyse the solutions by electrochemical techniques and apply it in real life situations like corrosion, soil, water testing etc (S2)

CO4: Analyse the solutions by spectroscopic techniques and apply it in real life situations like corrosion, soil, water testing etc (S2)

Pre-requisites :

NIL

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M											
CO2	M											
CO3	M					M						
CO4	M					M						

Course Assessment methods

Direct
1. Post-experiment Test/Viva; Experimental Report for each experiment; Model Examination 2. End Semester Examination
Indirect
1. Course-end survey

List of Experiments **30 hours**

1. Preparation of normal solutions of the following substances - Sodium carbonate, Hydrochloric acid and Buffer solution

WATER TESTING

2. Determination of total, temporary and permanent hardness by EDTA method.
3. Estimation of DO by Winkler's method
4. Estimation of alkalinity by Indicator method.
5. Estimation of chloride by Argentometric method.

ELECTRO CHEMICAL ANALYSIS

6. Estimation of hydrochloric acid by pH metry.
7. Conductometric estimation of mixture of acids and strong base
8. Estimation of corrosion of Iron by Potentiometry

PHOTOMETRY

9. Estimation of the extent of dissolution of Copper / Ferrous ions by Spectrophotmetry.
10. Estimation of sodium and potassium in water by Flame photometry.

DEMONSTRATION

11. Determination of Fire point and Flash point
12. Determination of Cloud and Pour point
13. Microscopic usage in Metallurgy.
14. Determination of Molecular weight by Viscometer

Theory: 0 Tutorial: 0 Practical: 30 Project: 0 Total: 30 Hours

REFERENCES

1. Jeffery G.H., Bassett J., Mendham J. and Denny R.C., Vogel's Text Book of Quantitative Chemical Analysis, Oxford, ELBS, London, 2012.
2. Shoemaker D.P. and C.W. Garland., Experiments in Physical Chemistry, Tata McGraw-Hill Pub. Co., Ltd., London, 2003.
3. Shoba U.S., Sivahari R. and Mayildurai R., Practical Chemistry, Inder Publications, Coimbatore, 2011.

U17EEP2511	ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY	L	T	P	J	C
		0	0	2	0	1

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Understand the performance characteristics of DC Motors
CO2: Understand the performance characteristics of AC Motors
CO3: Understand the characteristics of semiconductor devices.
CO4: Understand the VI characteristics of BJT.
CO5: Understand Ohms and Kirchhoff's Law.

Pre-requisites :

NIL

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S				W							
CO2	S	M										
CO3	M											
CO4		M		M								
CO5	M				W							

Course Assessment methods

Direct
1. Pre-or Post-experiment Test/Viva; Experimental Report for each experiment; Comprehensive report / Model Examination 2. End Semester Examination
Indirect
1. Course-end survey

List of Experiments **30 Hours**

ELECTRONICS:

1. Verification of Ohms and Kirchhoff's Law
2. Power Measurement in Simple RLC Circuits
3. V/I Characteristic of PN Junction Diode
4. V/I Characteristic of Zener Diode
5. V/I Characteristic of BJT

ELECTRICAL:

1. Torque - speed characteristics of dc shunt motor
2. Torque - speed characteristics of dc Compound motor
3. Torque - slip characteristics of single phase Induction Motor
4. Torque - slip characteristics of three phase Induction Motor
5. Open circuit test on transformer for finding the transformation ratio

Theory: 0 Tutorial: 0 Practical: 30 Project: 0 Total: 30 Hours

REFERENCES

1. Veerarajan T., "Probability and Statistics", Tata McGraw-Hill, New Delhi, 2007 & 2nd Reprint 2004.
2. Gupta S. P, "Statistical Methods", Sultan Chand & Sons Publishers, 2004.
3. Johnson R. A., "Miller & Freund's Probability and Statistics for Engineers", Sixth Edition, Pearson Education, Delhi, 2000.
4. Gupta S.C, and Kapur, J.N., "Fundamentals of Mathematical Statistics", Sultan Chand, Ninth Edition, New Delhi, 1996
5. Walpole R. E., Myers S.L. & Keying Ye, "Probability and Statistics for Engineers and Scientists", Pearson Education Inc, 2002

U17VEP2502 INTERPERSONAL VALUES

L	T	P	J	C
0	0	2	0	1

Course Outcomes

After successful completion of this course, the students should be able to

CO 1: Develop a healthy relationship & harmony with others
CO 2: Practice respecting every human being
CO 3: Practice to eradicate negative temperaments
CO 4: Acquire Respect, Honesty, Empathy, Forgiveness and Equality
CO 5: Practice Exercises and Meditation to lead a healthy life
CO 6: Manage the cognitive abilities of an Individual

Pre-requisites :

1. U17VEP1501 / PERSONAL VALUES

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1										S		
CO2									S			
CO3											M	S
CO4						M						
CO5												M
CO6											M	

Course Assessment methods

Direct
1.Group Activity / Individual performance and assignment 2.Assessment on Value work sheet / Test
Indirect
1. Mini project on values / Goodwill Recognition

Values through Practical activities: **30 hours**

1. Introduction: Introduction to interpersonal values – Developing harmony with others – Healthy relationship – Need & importance of interpersonal values for dealing with others and team - Effective communication with others.
2. Maneuvering the temperaments: From Greed To Contentment - Anger To Tolerance - Miserliness To Charity – Ego To Equality - Vengeance To Forgiveness.
3. Core value : **Truthfulness -** Honesty –Helping–Friendship – Brotherhood – Tolerance – Caring & Sharing – Forgiveness – Charity –Sympathy — Generosity – Brotherhood - Adaptability.
4.Pathway to Blissful life :
Signs of anger – Root cause – Chain reaction – Evil effects on Body and Mind – Analyzing roots of worries – Techniques to eradicate worries.

5.Therapeutic measures: Spine strengthening exercises - Nero muscular breathing exercises - Laughing therapy - Mindfulness meditation.

Theory: 0	Tutorial: 0	Practical: 30	Project: 0	Total: 30 hours

REFERENCES

1. INTERPERSONAL SKILLS Tutorial (PDF Version) - TutorialsPoint www.tutorialspoint.com/interpersonal_skills/interpersonal_skills_tutorial.pdf
2. INTERPERSONAL RELATIONSHIPS AT WORK - KI Open Archive - Karolinska www. publications.ki.se/xmlui/bitstream/handle/10616/39545/thesis.pdf?sequence=1
3. VALUES EDUCATION FOR PEACE, HUMAN RIGHTS, DEMOCRACY – UNESCO www.unesdoc.unesco.org/images/0011/001143/114357eo.pdf
4. MANEUVERING OF SIX TEMPERAMENTS - Vethathiri Maharishi www.ijhssi.org/papers/v5(5)/F0505034036.pdf
5. THE BLISS OF INNER FIRE: HEART PRACTICE OF THE SIX ... - Wisdom Publications - www.wisdompubs.org/sites/.../Bliss%20of%20Inner%20Fire%20Book%20Preview.pd...

U17ISR2001–SOCIAL IMMERSION PROJECT

L	T	P	J	C
0	0	0	4	2

(Common to all branches of Engineering and Technology)

COURSE OUTCOMES

After successful completion of this course, the students should be able to:

CO1: Achieve the desirable awareness regarding significant social problems and identify the needs to provide a possible and innovative solution.

CO2: Acquire and demonstrate effective professional and technical skills to deal with social issues through innovative leadership and sustainable services / approaches.

CO3: Provide students with a rich practical and socially oriented team work approach.

CO4: Explain how to make leadership decisions concerning organizational structure and the role of project resources on a project's team.

CO5: Enhance technical knowledge in addressing the needs of a community problem.

CO6: Identify tools and techniques for planning and working on a project.

CO/PO Mapping (S/M/W indicates strength of correlation)S-Strong, M-Medium, W-Weak												
COs	Programme Outcomes(POs)											
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1			S			S	S					
CO2			M	S		S	M	M	M			
CO3			S	W		S	S		S			M
CO4			S			S	S		W		M	
CO5	S		M			S	M					
CO6			S			S	S					

Course Assessment methods

Direct	Indirect
1. Project Review 2. General report preparation 3. Team Presentation	1. Impact study 2. Field Visit & Observation Skill 3. Course end survey

SOCIAL BONDING AND ENGINEERING

Society and its impact on the individual – Responsibility of individuals towards community building – Essential requirement of the society – Role of an engineering graduate in approaching the requirements - Developing social consciousness.

ENGINEERING PREREQUISITE FOR ENHANCED SOCIAL LIVING

Theoretical reading (Based on the project / general – Books to be identified by the team) - Inculcating Social immersion and Leadership- Study on the society and identifying problems - Social immersion and Engineering implementation - Analysis of problems on issue based - Identification of causes and effects of the social issue identified.

ESSENTIAL ENGINEERING INNOVATION

Essential Engineering Concepts - Multiple approaches towards the problem &Selection for addressing- Addressing a theoretical social problem -Providing multiple solutions for the problem

PROJECT PLANNING AND APPROACHES

Knowledge on budgeting and fund raising - Approaching agencies related to problems. Partnering with agencies- Presentation Skills - Report preparation

BROAD AREA OF PROJECTS

(Students can also identify their own social issue)

Water / Sanitation and Hygiene - Waste Management -Women Empowerment- Community health - Child health/ Poverty/Education/others - Energy management -Environment Management - Adult Education - -Youth Empowerment - Green Industry - Given above are the broad areas of projects recommended. Projects may vary to individuals/ groups/ class/ branch.

TOTAL : 60 Hours

References:

Nicholls Alex and Murdock Alex, Social Innovation Blurring Boundaries to reconfigure markets, Palgrave Macmillan., New York, 2012. :

Osburg Thomas and Schmidpeter Rene`, Social Innovation Solutions for sustainable Future. Springer, Germany 2013.

Adedeji B. Badiru, STEP Project Management: Guide for Science, Technology, and Engineering Projects. Taylor and Francis Group., Florida 2009.

ENGLISH ELECTIVES

Version 1 (17.8.17)

U17ENE2501 – ACADEMIC ENGLISH

L	T	P	J	C
0	0	4	0	2

(Common to all branches of Engineering and Technology)

COURSE OUTCOMES

After the course the Student will be able to:

CO1: Maintain the standards of communal communication and acquire excellent listening skills with good Received Pronunciation.
CO2: Accommodate with speaking skills, with fluency in communication obtaining levels of competency.
CO3: Project desirable research oriented skills to interface the corporate and meet out the challenges of the modern trends.
CO4: Familiarising with learner-centred strategies and improve writing activities through proper analysis.
CO5: Develop the ability in procuring information and effectiveness in communication based on situations.
CO6: Ability to present the individuals opinions, persuasion skills and academic curricular along with career profiles.

CO/PO Mapping
(S/M/W indicates strength of correlation)S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)												PSO	
	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
CO1				M		S	M		M	S	S	M		
CO2				M		S	M		M	S	S	M		
CO3				M		S	M		M	S	S	M		
CO4				M		S	M		M	S	M	M		
CO5				M		S	M		M	S	M	M		
CO6				M		S	M		M	S	M	M		

Course Assessment methods

Direct
6. Continuous Assessment 7. Cooperative learning 8. Assignment 9. Presentation 10. End Semester Examination
Indirect
1. Course-end survey

AUDITORY PERCEPTION **12**

Listening for understanding & information - short announcements, short conversations, telephonic conversation; Listening to British, American, Australian and Neutral Accent of Indian English; Listening and synthesizing information; Listening to TED/INK Talks (General); Critical review of short films, documentaries.

ORAL FLUENCY **12**

Informal introduction of self and others, conversation starters, articulating simple thoughts and ideas with clarity, Seeking Permission, Talking about People and Places. Describe an object or event. Retelling an incident, voicing opinions, persuasion skills, speaking from a single perspective (debate) - preparing and delivering an informal talk, Introduction to Presentation Skills – Formal tone – Impersonal style - Structuring and Presenting information. Transcode graphics orally.

FOUNDATIONS OF ACADEMIC WRITING **12**

Plan and write a library-based coursework assignment on an Engineering topic. Read academic textbooks and journal articles. Research and analyse scientific data and express understanding. Procuring information - Identifying research papers in a specific discipline, reading abstracts of research papers, reading the abstract of projects, reading articles from journals and publications and documenting/ archiving information.

TRAITS OF RESEARCH WRITING **12**

Reading research articles and summarizing. Review of Secondary sources - Writing an abstract - Writing an introduction to a paper in academic writing - Avoiding plagiarism – Bibliography – International Academic Styles of writing a research paper - Peer Evaluation.

PROCESS OF PREPARING A RESEARCH ARTICLE **12**

Research Projects – Converging areas of interest into field of research - Identifying the problem of research – Formulating hypothesis – Research Objectives – Literature Review – Identifying the research gap - Research methodology – Requirements – Plan of work – Result and Discussion – Conclusion – References – Appendices.

L: 0 P: 60 Total: 60 Hours

Reference Books:

1. English and Communication Skills—S.P.Dhanavel—Orient Blackswan Pvt Lted, Hyderabad.

2. Effective Technical Communication—Ashraf Rizvi—Tata McGraw Hill, New Delhi.

3. A Course in Communication Skils—Kiranmai Dutt, Geetha Rajeevan, C.L.N.Prakash—Foundation Books, New Delhi.

U17ENE2502 – PROFESSIONAL ENGLISH

(Common to all branches of Engineering and Technology)

L	T	P	J	C
0	0	4	0	2

COURSE OUTCOMES

After the course the Student will be able to:

CO1: Formulate an understanding for effective use of short telephonic and oral conversations.
CO2: Analyse and identify necessary interpersonal and persuasive skills for effective oral presentation.
CO3: Employ appropriate strategies to articulate random thoughts and ideas in brainstorming sessions.
CO4: Analyse and review technical and non-technical contents.

CO5: Compose and compile effective written documents needed in a professional scenario.

CO6: Recognize and establish dynamic corporate communication and relationship.

CO/PO Mapping
(S/M/W indicates strength of correlation)S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)												PSO	
	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
CO1										M				
CO2										S		M		
CO3										S		M		
CO4	M	S	M	S						S		M		
CO5				M						S				
CO6						M	M	S	S			S		

Course Assessment methods

Direct
1. Continuous Assessment 2. Review 3. Assignment 4. Report 5. End Semester Examination
Indirect
1. Course-end survey

AUDITORY PERCEPTION **12**

Listening for understanding & information - short announcements, short conversations, telephonic conversation; Listening to British, American, Australian and Neutral Accent of Indian English; Listening and synthesizing information; Listening to TED/INK Talks (General); Critical review of short films, documentaries

ORAL FLUENCY **12**

Informal introduction of self and others, conversation starters, articulating simple thoughts and ideas with clarity, Seeking Permission, Talking about People and Places, Describe an object or event. Retelling an incident, voicing opinions, persuasion skills, speaking from a single perspective (debate) - preparing and delivering an informal talk, Introduction to Presentation Skills – Formal tone – Impersonal style - Structuring and Presenting information. Transcode graphics orally

FOUNDATIONS OF PROFESSIONAL COMMUNICATION **12**

Focused listening, Listening to lectures and talks on science and technology, Listening in international seminars, Video Documentary review, Receiving compliments and sharing information in a corporate scenario, Speaking in Formal Context. Business Vocabulary. Speaking practice in a variety of registers, Giving and Getting Product and Service Information. Product Review. Recording equipment and safety checklist. Business Itinerary, Presenting a Company Profile, Encoding and decoding advertisements

CORPORATE DYNAMICS **12**

Corporate Social Responsibility, Crisis Management - handling issues and situations, Creating a powerful first impression, Goal Setting - Immediate goals, short term goals, long term goals, smart goals, strategies to achieve goals, Time Management - Types of time, Identifying time wasters, time management skills, Stress Management - Reasons, Strategies to cope up with stress, Stress-busters, Emotional Intelligence – Mental health, Job performance, Managing emotions

PROFESSIONAL WRITING **12**

Writing Agenda and minutes of the meetings, Writing daily/periodic reports, Writing business / professional letters, Business E-mail - Writing an Email Announcing a Meeting - Writing an Email Announcing the modifications in a Meeting - Writing an Email Announcing the cancellation/ postponement of Meeting

L: 0 P: 60 Total: 60 Hours

Reference Books:

1. Soft Skills for Young Managers—Prof.M.S.Rao—Biztantra Publications, New Delhi.

2. Soft Skills—Dr.K.Alex—S.Chand and Co, New Delhi.

3.Professional Communication—Aruna Koneru—Oxford University Press, New Delhi.

U17ENE2503 – ENGLISH FOR COMPETENCY

(Common to all branches of Engineering and Technology)

L	T	P	J	C
0	0	4	0	2

COURSE OUTCOMES

After the course the Student will be able to:

CO1*:* Recognize the inventory of listening strategies by various proposed listening activities.

CO2: Construct learning situations and increase speaking skills based on strong educational and communication theories.

CO3: Invent and practice effective reading strategy to enhance competent communication

CO4: Honing the strengths of writing skills and set objectives for future development

CO5: Showcase industry-ready attitude along with corporate communication=

CO6: Develop imaginative and critical thinking abilities, and improve the problem solving aptitude.

CO/PO Mapping
(S/M/W indicates strength of correlation)S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)												PSO	
	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
CO1				M		S	M		M	S	S	M		
CO2				M		S	M		M	S	S	M		
CO3				M		S	M		M	S	S	M		
CO4				M		S	M		M	S	M	M		
CO5				M		S	M		M	S	M	M		
CO6				M		S	M		M	S	M	M		

Course Assessment methods

Direct
1. Continuous Assessment 2. Review 3. Assignment 4. Report 5. End Semester Examination
Indirect
1. Course-end survey

AUDITORY PERCEPTION **12**

Listening for understanding & information - short announcements, short conversations, telephonic conversation; Listening to British, American, Australian and Neutral Accent of Indian English; Listening and synthesizing information; Listening to TED/INK Talks (General); Critical review of short films, documentaries.

ORAL FLUENCY **12**

Informal introduction of self and others, conversation starters, articulating simple thoughts and ideas with clarity, Seeking Permission, Talking about People and Places. Describe an object or event. Retelling an incident, voicing opinions, persuasion skills, speaking from a single perspective (debate) - preparing and delivering an informal talk, Introduction to Presentation Skills – Formal tone – Impersonal style - Structuring and Presenting information. Transcode graphics orally.

FOUNDATIONS OF ETS **12**

Analogy, Synonyms and antonyms, Morphemes –Derivational and Inflectional, Affixes – Prefix and Suffix, strategies to improve high frequency vocabulary

VERBAL BASED COMPETENCY **12**

Verbal Reasoning - Critical Reasoning & Verbal Deduction - Statement and Assumptions, Statement and Arguments, Statement and Inference, Strong and Weak Arguments, Sentence Correction,; Sentence Equivalence, Text Completion, Word Groups, Integrated Reasoning – Graphics Interpretation, Two-part Analysis, Table Analysis, Multi-source Reasoning

SKILL BASED COMPETENCY **12**

Analytical writing – Argumentative writing, a 30-minute Analyse an argument, a 30-minute Analyse an issue, Listening and Speaking Tasks in ETS, Reading Comprehension – GRE, GMAT, TOEFL, IELTS, GATE

L: 0 P: 60 Total: 60 Hours

Reference Books:

1. Personality Development and Soft Skill—Barun.K.Mitra—Oxford University Press, New Delhi.

2. A Modern Approach to Verbal and Non-verbal Reasoning—R.S.Agarwal—S.Chand & Co., New Delhi.

3. Soft Skills—Dr.K.Alex—S.Chand & Co., New Delhi.