Summary of credits										
Category	I	II	III	IV	V	VI	VII	VIII	Total	%
G (Excluding open and departmental electives)	5	3	3	3	1	1	3		19	10.56
B (Excluding open and departmental electives)	14	9	4	4	4	4			39	21.67
E (Excluding open and departmental electives)	6	7	3	3	3	3			25	13.89
P (Excluding open and departmental electives)		4	14	13	12	9	9	12	73	40.55
Open Elective					3	6			9	5
Dep. Elective				3	3	3	6		15	8.33
Total	24	23	24	26	25	26	17	12	180	100

PD1001	SOFT SKILLS-I	L	T	P	C
	Total Contact Hours - 30	1	0	1	1
	Prerequisite				
	Nil				

PURPOSE

To enhance holistic development of students and improve their employability skills.

INSTRUCTIONAL OBJECTIVES

1.	To develop inter personal skills and be an effective goal oriented team player.
2.	To develop professionals with idealistic, practical and moral values.
3.	To develop communication and problem solving skills.
4.	To re-engineer attitude and understand its influence on behavior.

UNIT I - SELF ANALYSIS   (4 hours)
SWOT Analysis, Who am I, Attributes, Importance of Self Confidence, Self Esteem

UNIT II - ATTITUDE   (4 hours)
Factors influencing Attitude, Challenges and lessons from Attitude.
Change Management
Exploring Challenges, Risking Comfort Zone, Managing Change

UNIT III - MOTIVATION   (6 hours)
Factors of motivation, Self talk, Intrinsic & Extrinsic Motivators.

UNIT IV - GOAL SETTING   (6 hours)
Wish List, SMART Goals, Blue print for success, Short Term, Long Term, Life Time Goals.
Time Management
Value of time, Diagnosing Time Management, Weekly Planner To do list, Prioritizing work.

UNIT V - CREATIVITY   (10 hours)
Out of box thinking, Lateral Thinking
Presentation

ASSESSMENT
1. A practical and activity oriented course which has continuous assessment for 75 marks based on class room interaction, activities etc.
2. Presentation – 25 marks.

TEXT BOOK

1.   INSIGHT, 2012, Career Development Centre, SRM Publications.

REFERENCES

1.   Covey Sean, "*Seven Habits of Highly Effective Teens"*, New York, Fireside Publishers, 1998.
2.   Carnegie Dale, "*How to win Friends and Influence People"*, New York: Simon & Schuster, 1998.
3.   Thomas A Harris, "*I am ok, You are ok"* , New York-Harper and Row, 1972.
4.   Daniel Coleman, "*Emotional Intelligence"*, Bantam Book, 2006.

PD1001 - SOFT SKILLS-I											
Course designed by	**Career Development Centre**										
1. Student Outcome	a	b	c	d	e	f	g	h	i	j	k
				X		X	X		X		
2. Mapping of instructional objectives with student outcome				1		2	3		4		
3. Category	General (G)			Basic Sciences (B)		Engineering Sciences and Technical Arts (E)			Professional Subjects (P)		
	X										
4. Approval	23rd meeting of Academic Council, May 2013										

			L	T	P	C
	VALUE EDUCATION		1	0	0	1
LE1002	Total Contact Hours- 15					
	Prerequisite					
	Nil					

PURPOSE

To provide guiding principles and tools for the development of the whole person recognizing that the individual is comprised of Physical, Intellectual, Emotional and Spiritual dimensions.

INSTRUCTIONAL OBJECTIVES	
1.	To help individuals think about and reflect on different values.
2.	To deepen understanding, motivation and responsibility with regard to making personal and social choices and the practical implications of expressing them in relation to themselves, others, the community and the world at large
3.	To inspire individuals to choose their own personal, social, moral and spiritual values and be aware of practical methods for developing and deepening

UNIT I- INTRODUCTION   **(3 hours)**
Definition, Relevance, Types of values, changing concepts of values

UNIT II- INDIVIDUAL AND GROUP BEHAVIOUR   **(3 hours)**
Personal values – Self – Strengths (self-confidence, self-assessment, self-reliance, self-discipline, determination, self-restraint, contentment, humility, sympathy and compassion, gratitude, forgiveness) Weaknesses (Influences -- Peer pressure, familial and societal expectations, media)

UNIT III- SOCIETIES IN PROGRESS   **(3 hours)**
Definition of society; Units of society; Communities – ancient and modern – Agents of change – Sense of survival, security, desire for comfort and ease sense of belonging, social consciousness and responsibility

UNIT IV- ENGINEERING ETHICS   **(3 hours)**
Definition - Societies for engineers – Code of Ethics – Ethical Issues involved in cross border research -- Ethical and Unethical practices – case studies – situational decision making

UNIT V- SPIRITUAL VALUES   **(3 hours)**
What is religion? -- Role of religion – Misinterpretation of religion – moral policing – Consequences -- Religion as spiritual quest – Aesthetics and religion

TEXT BOOK
1. Department of English and Foreign Languages SRM University, "*Rhythm of Life",* SRM Publications, 2013.

REFERENCE

1. *"Values (Collection of Essays".* Published by : Sri Ramakrishna Math, Chennai-4. 1996.

LE1002 VALUE EDUCATION											
Course designed by	**Department of English and Foreign Languages**										
1.	Student outcome	a	b	c	d	e	f	g	h	i	J	k
							x			x		
2.	Mapping of instructional objectives with student outcome						1-3			1-3		
3.	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)			Professional Subjects (P)			
		x		--		--			--			
4.	Approval	23rd meeting of Academic Council, May 2013										

CS1001	**PROGRAMMING USING MATLAB**	**L**	**T**	**P**	**C**
	Total Contact hours - 45	**0**	**1**	**2**	**2**
	Prerequisite				
	Nil				

PURPOSE

This Lab Course will enable the students to understand the fundamentals and programming knowledge in MATLAB.

INSTRUCTIONAL OBJECTIVES

1.	To learn the MATLAB environment and its programming fundamentals
2.	Ability to write Programs using commands and functions
3.	Able to handle polynomials, and use 2D Graphic commands

LIST OF EXPERIMENTS

1. Practicing MATLAB environment with simple exercises to familiarize Command Window, History, Workspace, Current Directory, Figure window, Edit window, Shortcuts, Help files.
2. Data types, Constants and Variables, Character constants, operators, Assignment statements.
3. Control Structures: For loops, While, If control structures, Switch, Break, Continue statements.

4. Input-Output functions, Reading and Storing Data.
5. Vectors and Matrices, commands to operate on vectors and matrices, matrix Manipulations.
6. Arithmetic operations on Matrices, Relational operations on Matrices, Logical operations on Matrices.
7. Polynomial Evaluation, Roots of Polynomial, Arithmetic operations on Polynomials.
8. Graphics: 2D plots, Printing labels, Grid & Axes box, Text in plot, Bar and Pie chart.

TEXT BOOK
1. Bansal R.K, Goel A.K., Sharma M.K., "*MATLAB and its Applications in Engineering*", Pearson Education, 2012.

REFERENCES
1. Amos Gilat, *"MATLAB-An Introduction with Applications"*, Wiley India, 2009.
2. Stephen.J.Chapman, *"Programming in MATLAB for Engineers"*, Cengage Learning, 2011.

CS1001 PROGRAMMING USING MATLAB											
Course designed by	Department of Computer Science and Engineering										
1. Student outcome	a	b	c	d	e	f	g	h	i	j	k
	x	x									x
2. Mapping of instructional objective with student outcome	2,3	1,2, 3									1
3. Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts(E)			Professional Subjects(P)			
	x										
4. Approval	23rd meeting of Academic Council, May 2013										

MA1001	CALCULUS AND SOLID GEOMETRY	L	T	P	C
		3	2	0	4
	Total Contact Hours-75				
	(Common to all Branches of Engineering except Bio group)				

PURPOSE	
To impart analytical ability in solving mathematical problems as applied to the respective branches of Engineering.	

INSTRUCTIONAL OBJECTIVES	
1.	To apply advanced matrix knowledge to Engineering problems.
2.	To equip themselves familiar with the functions of several variables.
3.	To familiarize with the applications of differential equations.
4.	To improve their ability in solving geometrical applications of differential calculus problems
5.	To expose to the concept of three dimensional analytical geometry.

UNIT I- MATRICES   (15 Hours)

Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values – Cayley – Hamilton theorem orthogonal reduction of a symmetric matrix to diagonal form – Orthogonal matrices – Reduction of quadratic form to canonical form by orthogonal transformations.

UNIT II- FUNCTIONS OF SEVERAL VARIABLES   (15hours)

Function of two variables – Partial derivatives – Total differential – Taylor's expansion – Maxima and Minima – Constrained Maxima and Minima by Lagrangian Multiplier method – Jacobians – Euler's theorem for homogeneous function.

UNIT III- ORDINARY DIFFERENTIAL EQUATIONS   (15hours)

Linear equations of second order with constant and variable coefficients – Homogeneous equation of Euler type – Equations reducible to homogeneous form – Variation of parameter – Simultaneous first order with constant co-efficient.

UNIT IV- GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS
                                                                          (15 hours)

Curvature – Cartesian and polar coordinates – Circle of curvature – Involutes and Evolutes – Envelopes – Properties of envelopes.

UNIT V- THREE DIMENSIONAL ANALYTICAL GEOMETRY (15 hours)

Equation of a sphere – Plane section of a sphere – Tangent Plane – Orthogonal Sphere - Equation of a cone – Right circular cone – Equation of a cylinder – Right circular cylinder.

TEXT BOOKS

1. Kreyszig.E, "*Advanced Engineering Mathematics*", John Wiley & Sons. Singapore, 10th edition, 2012.
2. K.Ganesan, Sundarammal Kesavan, K.S.Ganapathy Subramanian & V.Srinivasan, "*Engineering Mathematics*", Gamma publications, Revised Edition, 2013.

REFERENCES

1. Grewal B.S, "*Higher Engineering Mathematics*", Khanna Publications, 42nd Edition,2012.
2. Veerajan. T, "*Engineering Mathematics I*", Tata McGraw Hill Publishing Co, New Delhi, 5th edition, 2006.
3. Kandasamy P etal. "*Engineering Mathematics*", Vol.I (4th revised edition), S.Chand & Co., New Delhi, 2000.
4. Narayanan S., Manicavachagom Pillay T.K., Ramanaiah G., "*Advanced "Mathematics for Engineering students*", Volume I (2nd edition), S.Viswanathan Printers and Publishers, 1992.
5. Venkataraman M.K., "*Engineering Mathematics*" – First Year (2nd edition), National Publishing Co., Chennai, 2000.

MA1001 CALCULUS AND SOLID GEOMETRY											
Course designed by	Department of Mathematics										
1.	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		x				x						
2.	Mapping of instructional objectives with student outcome	1-5				1-5						
3.	Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)				Professional Subjects (P)		
		--		x		--				--		
4.	Approval	23rd meeting of academic council, May 2013										

	PHYSICS	**L**	**T**	**P**	**C**
PY1001	Total Contact Hours-45	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE
The purpose of this course is to provide an understanding of physical concepts and underlying various engineering and technological applications. In addition, the course is expected to develop scientific temperament and analytical skill in students, to enable them logically tackle complex engineering problems in their chosen area of application.

INSTRUCTIONAL OBJECTIVES	
1.	To understand the general scientific concepts required for technology
2.	To apply the Physics concepts in solving engineering problems
3.	To educate scientifically the new developments in engineering and technology
4.	To emphasize the significance of Green technology through Physics principles

UNIT I – MECHANICAL PROPERTIES OF SOLIDS AND ACOUSTICS   (9 hours)

Mechanical properties of solids: Stress-strain relationship – Hooke's law – Torsional Pendulum – Young's modulus by cantilever – Uniform and non-uniform bending –– Stress-strain diagram for various engineering materials – Ductile and brittle materials – Mechanical properties of Engineering materials (Tensile strength, Hardness, Fatigue, Impact strength, Creep) – Fracture – Types of fracture (Elementary ideas).

Acoustics: Intensity – Loudness – Absorption coefficient and its determination – Reverberation – Reverberation time – Factors affecting acoustics of buildings and their remedies – Sources and impacts of noise – Sound level meter – Strategies on controlling noise pollution – Ultrasonic waves and properties – Methods of Ultrasonic production (Magnetostriction and Piezoelectric) – Applications of Ultrasonics in Engineering and medicine.

UNIT II–ELECTROMAGNETIC WAVES, CIRCUITS AND APPLICATIONS

(9 hours)

Del operator – grad, div, curl and their physical significances - displacement current –Maxwell's equations (derivation) – Wave equation for electromagnetic waves – Propagation in free space – Poynting theorem – Characteristic of Transverse electric and magnetic waves – Skin depth – Rectangular and circular waveguides – High powered vacuum-based cavity magnetrons – Applications including radars, microwave oven and lighting systems.

UNIT III– LASERS AND FIBER OPTICS   (9 hours)

Lasers: Characteristics of Lasers – Einstein's coefficients and their relations – Lasing action – Working principle and components of CO_2 Laser, Nd-YAG Laser, Semiconductor diode Laser, Excimer Laser and Free electron Laser – Applications in Remote sensing, holography and optical switching – Mechanism of Laser cooling and trapping.

Fiber Optics: Principle of Optical fiber – Acceptance angle and acceptance cone – Numerical aperture – V-number – Types of optical fibers (Material, Refractive index and mode) – Photonic crystal fibers – Fiber optic communication – Fiber optic sensors.

UNIT IV– QUANTUM MECHANICS AND CRYSTAL PHYSICS   (9 hours)

Quantum mechanics: Inadequacies of Classical Mechanics – Duality nature of electromagnetic radiation – De Broglie hypothesis for matter waves – Heisenberg's uncertainty principle –Schrödinger's wave equation – Particle confinement in 1D box (Infinite Square well potential). **Crystal Physics:** Crystal directions – Planes and Miller indices – Symmetry elements – Quasi crystals – Diamond and HCP crystal structure – Packing factor – Reciprocal lattice – Diffraction of X-rays by crystal planes – Laue method and powder method – Imperfections in crystals.

UNIT V– GREEN ENERGY PHYSICS   (9 hours)

Introduction to Green energy – **Solar energy:** Energy conversion by photovoltaic principle – Solar cells – **Wind energy:** Basic components and principle of wind energy conversion systems – **Ocean energy:** Wave energy – Wave energy conversion devices – Tidal energy – single and double basin tidal power plants – Ocean Thermal Electric Conversion (OTEC) – **Geothermal energy:** Geothermal sources (hydrothermal, geo-pressurized hot dry rocks, magma) – **Biomass:** Biomass and bio-fuels – bio-energies from wastages – **Fuel cells**: H_2O_2 – **Futuristic Energy:** Hydrogen – Methane Hydrates – Carbon capture and storage (CCS).

*   One problem sheet consisting of 10 to 15 problems is to be prepared for each unit and discussed in the class.

*   Few problems based on design considerations related to appropriate branches of engineering can be incorporated in each problem sheet.

TEXT BOOKS

1. Thiruvadigal, J. D., Ponnusamy,S..Sudha.D. and Krishnamohan M., *"Physics for Technologists"*, Vibrant Publication, Chennai, 2013.
2. Dattu R.Joshi, *"Engineering Physics"*, Tata McGraw- Hill,New Delih,2010.

REFERENCES

1. Wole Soboyejo, *"Mechanical Properties of Engineered Materials"*, Marcel Dekker Inc., 2003.
2. Frank Fahy, *"Foundations of Engineering Acoustics"*, Elsevier Academic Press, 2005.
3. Alberto Sona, *"Lasers and their applications"*, Gordon and Breach Science Publishers Ltd., 1976.
4. David J. Griffiths, *"Introduction to electrodynamics"*, 3rd ed., Prentice Hall, 1999.
5. Leonard. I. Schiff, *"Quantum Mechanics"*, Third Edition, Tata McGraw Hill, 2010.
6. Charles Kittel, "*Introduction to Solid State Physics*", Wiley India Pvt. Ltd, 7th ed., 2007.
7. Godfrey Boyle, *"Renewable Energy: Power sustainable future"*, 2nd edition, Oxford University Press, UK, 2004.

PY1001 PHYSICS											
Course designed by	Department of Physics and Nanotechnology										
1. Student Outcome	a	b	c	d	e	f	g	h	i	j	k
	x		x		x						x
2. Mapping of instructional objectives with student outcome	1		4		2						3
3. Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)		
	--		x			--			--		
4. Approval	23rd meeting of Academic Council, May 2013										

PY1002	PHYSICS LABORATORY	L	T	P	C
	Total Contact Hours - 30	0	0	2	1
	Prerequisite				
	Nil				

PURPOSE

The purpose of this course is to develop scientific temper in experimental techniques and to reinforce the physics concepts among the engineering students

INSTRUCTIONAL OBJECTIVES

1.	To gain knowledge in the scientific methods and learn the process of measuring different Physical variables
2.	Develop the skills in arranging and handling different measuring instruments
3.	Get familiarized with experimental errors in various physical measurements and to plan / suggest on how the contributions could be made of the same order, so as to minimize the errors.

LIST OF EXPERIMENTS

1. Determination of Young's modulus of a given material – Uniform / Non-uniform bending methods.
2. Determination of Rigidity modulus of a given material – Torsion pendulum
3. Determination of dispersive power of a prism – Spectrometer
4. Determination of laser parameters – divergence and wavelength for a given laser source –laser grating/ Particle size determination using laser
5. Study of attenuation and propagation characteristics of optical fiber cable
6. Calibration of voltmeter / ammeter using potentiometer
7. Construction and study of IC regulation properties of a given power supply
8. Study of electrical characteristics of a solar cell
9. Mini Project – Concept based Demonstration

TEXT BOOKS

1. Thiruvadigal, J. D., Ponnusamy,S..Sudha.D. and Krishnamohan M., *"Physics for Technologists"*, Vibrant Publication, Chennai, 2013
2. R.K.Shukla and Anchal Srivastava, *"Practical Physics"*, 1st Edition, New Age International (P) Ltd, New Delhi, 2006.

REFERENCES

1. G.L.Souires, "*Practical Physics:*", 4th Edition, Cambridge University, UK, 2001.
2. D. Chattopadhyay, P. C. Rakshit and B. Saha, "*An Advanced Course in Practical Physics*", 2nd ed., Books & Allied Ltd., Calcutta, 1990.

PY1002 PHYSICS LABORATORY											
Course designed by	Department of Physics and Nanotechnology										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		x	x			x						
2	Mapping of instructional objectives with student outcome	1	3			2						
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)		
		--		x			--			--		
4	Approval	23rd meeting of Academic Council, May 2013										

CY1001	CHEMISTRY	L	T	P	C
	Total Contact Hours - 45	**3**	**0**	**0**	**3**
	Prerequisite				
	Nil				

PURPOSE

To enable the students to acquire knowledge in the principles of chemistry for engineering applications

INSTRUCTIONAL OBJECTIVES

1.	The quality of water and its treatment methods for domestic and industrial applications.
2.	The classification of polymers, different types of polymerizations, preparation, properties and applications of important polymers and FRPs.
3.	The phase rule and its application to one and two component systems.
4.	The principle, types and mechanism of corrosion and protective coatings.
5.	The classification and selection of lubricants and their applications.
6.	The basic principles, instrumentation and applications of analytical techniques

UNIT I-WATER TREATMENT   (9 hours)

Water quality parameters: Physical, Chemical & Biological significance - Hardness of water - estimation of hardness (EDTA method) - Dissolved oxygen – determination (Winkler's method), Alkalinity - determination - disadvantages of using hard water in boilers: Scale, sludge formation - disadvantages - prevention - treatment: Internal conditioning - phosphate, carbon and carbonate conditioning methods - External: Zeolite, ion exchange methods - desalination - reverse osmosis and electrodialysis - domestic water treatment.

UNIT II - POLYMERS AND REINFORCED PLASTICS   (9 hours)

Classification of polymers - types of polymerization reactions - mechanism of addition polymerization: free radical, ionic and Ziegler - Natta - effect of structure on the properties of polymers - strength, plastic deformation, elasticity and crystallinity -Preparation and properties of important resins: Polyethylene, PVC, PMMA, Polyester, Teflon, Bakelite and Epoxy resins - compounding of plastics - moulding methods - injection, extrusion, compression and calendaring - reinforced plastics - FRP – Carbon and Glass- applications.

UNIT III - PHASE EQUILIBRIA, LUBRICANTS AND ADHESIVES   (9 hours)

Phase rule: Statement - explanation of the terms involved - one component system (water system only). Condensed phase rule - thermal analysis - two component systems: simple eutectic, Pb-Ag; compound formation, Zn-Mg.
Lubricants: Classification –solid, semi solid, liquid, emulsion- properties – selection of lubricants for different purposes, Adhesives: classification-natural, synthetic, inorganic- Adhesive action - applications.

UNIT IV- CORROSION AND ITS CONTROL   (9 hours)

Corrosion: Basic concepts - mechanism of chemical, electrochemical corrosion - Pilling Bedworth rule – Types of Electrochemical corrosion - galvanic corrosion - differential aeration corrosion - pitting corrosion - stress corrosion – Measurement of corrosion (wt. loss method only) - factors influencing corrosion. Corrosion control: Cathodic protection - sacrificial anodic method - corrosion inhibitors. Protective coatings: surface preparation for metallic coatings - electro plating (copper plating) and electroless plating (Nickel plating) - chemical conversion coatings - anodizing, phosphating & chromate coating.

UNIT V- INSTRUMENTAL METHODS OF ANALYSIS   (9 hours)

Basic principles, instrumentation and applications of potentiometry, UV - visible spectroscopy, infrared spectroscopy, atomic absorption spectroscopy and flame photometry .

TEXT BOOKS

1. Kamaraj.P & Arthanareeswari. M, "*Applied Chemistry", 9th Edition*, Sudhandhira Publications, 2012.
2. S.S.Dara, A Text book of Engineering Chemistry, 10th Edition, S.Chand & Company Ltd., New Delhi, 2003

REFERENCES

1. Jain.P.C and Monika Jain, "*Engineering Chemistry*", Danpat Rai publishing company (P) Ltd, New Delhi, 2010.
2. Helen P Kavitha, "*Engineering Chemistry – I", Scitech* Publications, 2nd edition, 2008.

<table>
<tr><th colspan="12">CY1001 CHEMISTRY</th></tr>
<tr><td colspan="2">Course designed by</td><td colspan="10">Department of Chemistry</td></tr>
<tr><td rowspan="2">1.</td><td rowspan="2">Student outcome</td><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td><td>i</td><td>j</td><td>k</td></tr>
<tr><td>x</td><td>x</td><td>x</td><td></td><td>x</td><td></td><td></td><td></td><td></td><td></td><td>x</td></tr>
<tr><td>2.</td><td>Mapping of instructional objective with student outcome</td><td>1-6</td><td>1,5</td><td>3</td><td></td><td>2</td><td></td><td></td><td></td><td></td><td></td><td>4</td></tr>
<tr><td rowspan="2">3.</td><td rowspan="2">Category</td><td colspan="2">General (G)</td><td colspan="2">Basic Sciences (B)</td><td colspan="3">Engineering Sciences and Technical Arts (E)</td><td colspan="3">Professional Subjects (P)</td></tr>
<tr><td colspan="2">--</td><td colspan="2">x</td><td colspan="3">--</td><td colspan="3">--</td></tr>
<tr><td>4.</td><td>Approval</td><td colspan="10">23rd meeting of Academic Council, May 2013</td></tr>
</table>

<table>
<tr><td rowspan="4">CY1002</td><td colspan="2">CHEMISTRY LABORATORY</td><td>L</td><td>T</td><td>P</td><td>C</td></tr>
<tr><td colspan="2">Total Contact Hours - 30</td><td>0</td><td>0</td><td>2</td><td>1</td></tr>
<tr><td colspan="2">Prerequisite</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Nil</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="7">PURPOSE</td></tr>
<tr><td colspan="7">To apply the concepts of chemistry and develop analytical skills for applications in engineering.</td></tr>
<tr><td colspan="7">INSTRUCTIONAL OBJECTIVES</td></tr>
<tr><td colspan="7">1. To enable the students to understand the basic concepts involved in the analyses.</td></tr>
</table>

LIST OF EXPERIMENTS
1. Preparation of standard solutions
2. Estimation of total, permanent and temporary hardness by EDTA method
3. Conductometric titration - determination of strength of an acid
4. Estimation of iron by potentiometry.
5. Determination of molecular weight of polymer by viscosity average method
6. Determination of dissolved oxygen in a water sample by Winkler's method
7. Determination of Na/K in water sample by Flame photometry (Demonstration)
8. Estimation of Copper in ore
9. Estimation of nickel in steel
10. Determination of total alkalinity and acidity of a water sample
11. Determination of rate of corrosion by weight loss method.

REFERENCES
1. Kamaraj & Arthanareeswari, Sudhandhira Publications "*Practical Chemistry*" (work book) , 2011.
2. Helen P. Kavitha "*Chemistry Laboratory Manual*", Scitech Publications, 2008.

<table>
<tr><td colspan="12">CY1002 CHEMISTRY LABORATORY</td></tr>
<tr><td colspan="2">Course designed by</td><td colspan="10">Department of Chemistry</td></tr>
<tr><td rowspan="2">1.</td><td rowspan="2">Student outcome</td><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td><td>i</td><td>j</td><td>k</td></tr>
<tr><td>x</td><td>x</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>x</td></tr>
<tr><td>2.</td><td>Mapping of instructional objective with student outcome</td><td>1</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td></tr>
<tr><td rowspan="2">3.</td><td rowspan="2">Category</td><td colspan="2">General (G)</td><td colspan="3">Basic Sciences (B)</td><td colspan="2">Engineering Sciences and Technical Arts(E)</td><td colspan="3">Professional Subjects (P)</td></tr>
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<tr><td>4.</td><td>Approval</td><td colspan="10">23rd meeting of Academic Council, May 2013</td></tr>
</table>

BT1001	**BIOLOGY FOR ENGINEERS**	L	T	P	C
	Total Contact Hours - 30	2	0	0	2
	Prerequisite				
	Nil				

PURPOSE

The purpose of this course is to provide a basic understanding of biological mechanisms of living organisms from the perspective of engineers. In addition, the course is expected to encourage engineering students to think about solving biological problems with engineering tools.

INSTRUCTIONAL OBJECTIVES	
1.	To familiarize the students with the basic organization of organisms and subsequent building to a living being
2.	To impart an understanding about the machinery of the cell functions that is ultimately responsible for various daily activities.
3.	To provide knowledge about biological problems that require engineering expertise to solve them

UNIT I- BASIC CELL BIOLOGY (6 hours)

Introduction: Methods of Science-Living Organisms: Cells and Cell theory Cell Structure and Function, Genetic information, protein synthesis, and protein structure, Cell metabolism-Homoeostasis- Cell growth, reproduction, and differentiation.

UNIT II- BIOCHEMISTRY AND MOLECULAR ASPECTS OF LIFE (5 hours)

Biological Diversity --Chemistry of life: chemical bonds--Biochemistry and Human biology--Protein synthesis—Stem cells and Tissue engineering.

UNIT III- ENZYMES AND INDUSTRIAL APPLICATIONS (5 hours)

Enzymes: Biological catalysts, Proteases, Carbonic anhydrase, Restriction enzymes, and Nucleoside monophosphate kinases—Photosynthesis

UNIT IV- MECHANOCHEMISTRY (7 hours)

Molecular Machines/Motors—Cytoskeleton—Bioremediation—Biosensors

UNIT V- NERVOUS SYSTEM, IMMUNE SYSTEM, AND CELL SIGNALING
(7 hours)

Nervous system--Immune system- General principles of cell signaling.

TEXT BOOK

1. S. ThyagaRajan, N. Selvamurugan, M. P. Rajesh, R. A. Nazeer, Richard W. Thilagaraj, S. Barathi, and M. K. Jaganathan, "*Biology for Engineers*," Tata McGraw-Hill, New Delhi, 2012.

REFERENCES

1. Jeremy M. Berg, John L. Tymoczko and Lubert Stryer, "*Biochemistry*," W.H. Freeman and Co. Ltd., 6th Ed., 2006.
2. Robert Weaver, "*Molecular Biology*," MCGraw-Hill, 5th Edition, 2012.
3. Jon Cooper, "*Biosensors A Practical Approach*" Bellwether Books, **2**004.

4. Martin Alexander, "*Biodegradation and Bioremediation,*" Academic Press, 1994.
5. Kenneth Murphy, "*Janeway's Immunobiology*," Garland Science; 8th edition, 2011.
6. Eric R. Kandel, James H. Schwartz, Thomas M. Jessell, "Principles of Neural Science, McGraw-Hill, 5th Edition, 2012.

BT1001 BIOLOGY FOR ENGINEERS												
Course designed by		**Department of Biotechnology**										
1. Student Outcome		a	b	c	d	e	f	g	h	i	j	k
		x			x						x	
2. Mapping of instructional objectives with student outcome		1			2						3	
3. Category		General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)			Professional Subjects (P)			
				x								
4. Approval		23rd meeting of Academic Council, May 2013										

		BASIC CIVIL ENGINEERING	L	T	P	C
CE1001		Total Contact Hours - 30	**2**	**0**	**0**	**2**
		Prerequisite				
		Nil				

PURPOSE

To get exposed to the glimpses of Civil Engineering topics that is essential for an Engineer.

INSTRUCTIONAL OBJECTIVES

1. To know about different materials and their properties
2. To know about engineering aspects related to buildings
3. To know about importance of surveying and the transportation systems
4. To get exposed to the rudiments of engineering related to dams, water supply, and sewage disposal

UNIT I - BUILDING MATERILAS   (6hours)

Introduction – Civil Engineering – Materials: Bricks – composition – classifications – properties –uses. Stone – classification of rocks – quarrying – dressing – properties –uses. Timber - properties –uses –ply wood. Cement – grades –types – properties –uses. Steel – types – mild steel – medium steel – hard steel – properties – uses – market forms. Concrete – grade designation – properties – uses.

UNIT II - MATERIAL PROPERTIES   (6hours)

Stress – strain – types – Hook's law – three moduli of elasticity – poisons ratio – relationship – factor of safety. Centroid - center of gravity – problems in symmetrical sections only (I, T and channel sections). Moment of inertia, parallel, perpendicular axis theorems and radius of gyration (definitions only).

UNIT III - BUILDING COMPONENTS   (6hours)

Building – selection of site – classification – components. Foundations –functions – classifications – bearing capacity. Flooring – requirements – selection – types – cement concrete marble – terrazzo floorings. Roof – types and requirements.

UNIT IV - SURVEYING AND TRANSPORTATION   (6hours)

Surveying – objectives – classification – principles of survey. Transportation – classification – cross section and components of road – classification of roads. Railway – cross section and components of permanent way –functions. Water way – docks and harbor – classifications – components. Bridge – components of bridge.

UNIT V- WATER SUPPLY AND SEWAGE DISPOSAL   (6hours)

Dams – purpose – selection of site – types –gravity dam   (cross section only). Water supply – objective – quantity of water – sources – standards of drinking water – distribution system. Sewage – classification – technical terms – septic tank – components and functions.

TEXT BOOKS

1. Raju K.V.B., Ravichandran P.T., "*Basics of Civil Engineering*", Ayyappa Publications, Chennai, 2012.
2. Rangwala,S.C., "*Engineering Materials*", Charotar Publishing House, Anand, 2012.

REFERENCES

1. Ramesh Babu, "*Civil Engineering*", VRB Publishers, Chennai, 2000.
2. National Building Code of India, Part V, "*Building Material's*", 2005.
3. Surendra Singh, "*Building Material's*", Vikas Publishing Company, New Delhi, 1996.

CE1001 - BASIC CIVIL ENGINEERING											
Course designed by	**Department of Civil Engineering**										
1. Student outcome	a	b	c	d	e	f	g	h	i	j	k
	x				x						x
2. Mapping of instructional objectives with student outcome	1 - 4				1-4						2-4
3. Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)			Professional Subjects (P)			
					x						
4. Approval	23rd meeting of academic council , May 2013										

		BASIC ELECTRICAL ENGINEERING	L	T	P	C
EE1001		Total Contact Hours - 30	**2**	**0**	**0**	**2**
		Prerequisite				
		Nil				

PURPOSE

This course provides comprehensive idea about circuit analysis, working principles of machines and common measuring instruments.

INSTRUCTIONAL OBJECTIVES

1.	Understand the basic concepts of magnetic circuits, AC & DC circuits.
2.	Explain the working principle, construction, applications of DC & AC machines and measuring instruments.
3.	Gain knowledge about the fundamentals of wiring and earthing

UNIT I – FUNDAMENTALS OF DC CIRCUITS   (6 hours)

Introduction to DC and AC circuits, Active and passive two terminal elements, Ohms law, Voltage-Current relations for resistor, inductor, capacitor , Kirchhoff's laws, Mesh analysis, Nodal analysis, Ideal sources –equivalent resistor, current division, voltage division

UNIT II – MAGNETIC CIRCUITS   (6 hours)
Introduction to magnetic circuits-Simple magnetic circuits-Faraday's laws, induced emfs and inductances

UNIT III – AC CIRCUITS   (6 hours)
Sinusoids, Generation of AC, Average and RMS values, Form and peak factors, concept of phasor representation, J operator. Analysis of R-L, R-C, R-L-C circuits. Introduction to three phase systems - types of connections, relationship between line and phase values.

UNIT IV–ELECTRICAL MACHINES & MEASURING INSTRUMENTS   (6 hours)
Working principle, construction and applications of DC machines and AC machines (1 - phase transformers, single phase induction motors: split phase, capacitor start and capacitor start & run motors). Basic principles and classification of instruments -Moving coil and moving iron instruments.

UNIT V– ELECTRICAL SAFETY, WIRING &INTRODUCTION TO POWER SYSTEM
                                                                  (6 hours)
Safety measures in electrical system- types of wiring- wiring accessories-staircase, fluorescent lamps & corridor wiring- Basic principles of earthing-Types of earthing- Simple layout of generation, transmission & distribution of power.

TEXT BOOK
1. S.S.Dash,C.Subramani,K.Vijayakumar,"BasicElectrical   Engineering",   First edition, Vijay Nicole Imprints Pvt.Ltd,2013

REFERENCES
1. Smarajt Ghosh, "*Fundamentals of Electrical & Electronics Engineering*", Second edition, PHI Learning, 2007.
2. V.K.Metha, Rohit Metha, "*Basic Electrical Engineering*", Fifth edition, S.Chand & Co, 2012.
3. Kothari D. P and Nagrath IJ, "*Basic Electrical Engineering*", Second edition, Tata McGraw - Hill, 2009
4. S. K. Bhattacharya, "*Basic Electrical and Electronics Engineering*", First edition, Pearson Education, 2011

EE1001 - BASIC ELECTRICAL ENGINEERING											
Course designed by		**Department of Electrical and Electronics Engineering**									
1. Student outcomes		a	b	c	d	e	f	g	h	i	j	k
		x				x						
2. Mapping of instructional objectives with student outcome		1-3				1						
3. Category		General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts(E)			Professional Subjects(P)			
		--		--		x			--			
4. Approval		23rd meeting of Academic Council, May 2013										

IT1001	COMPUTER HARDWARE AND TROUBLESHOOTING LAB	L	T	P	C
	Total contact hours - 60	0	0	4	2
	Prerequisite				
	Nil				

PURPOSE

This course is designed to enable the students to get a detailed knowledge of all the hardware components that make up a computer and to understand the different interfaces required for connecting these hardware devices.

INSTRUCTIONAL OBJECTIVES

1.	Understand the components on the motherboard
2.	Perform system administration tasks
3.	Understand different storage media
4.	Understand system related problems and methods of troubleshooting

LIST OF EXPERIMENTS

1. Study and Identification of standard desktop personal computer
2. Understanding of Motherboard and its interfacing components
3. Install and configure computer drivers and system components.
4. Disk formatting, partitioning and Disk operating system commands
5. Install, upgrade and configure Windows operating systems.
6. Remote desktop connections and file sharing.
7. Identify, Install and manage network connections Configuring IP address and Domain name system
8. Install, upgrade and configure Linux operating systems.
9. Installation Antivirus and configure the antivirus.
10. Installation of printer and scanner software.

11. Disassembly and Reassembly of hardware.
12. Trouble shooting and Managing Systems

REFERENCES

1. Craig Zacker& John Rourke, "*The complete reference : PC hardware*", Tata McGraw- Hill, New Delhi, 2001.
2. Mike Meyers, "*Introduction to PC Hardware and Troubleshooting*", Tata McGraw-Hill, New Delhi, 2003.
3. Govindarajulu B., "*IBM PC and Clones hardware trouble shooting and maintenance*", Tata McGraw-Hill, New Delhi, 2002.

IT1001 COMPUTER HARDWARE AND TROUBLESHOOTING LAB													
Course designed by			**Department of Information Technology**										
1. Student outcome	a	b	c	d	e	f	g	h	i	j	k	l	m	n
									x		x			
2. Mapping of instructional objectives with student outcome									2		1,3,4			
3. Category	General (G)		Basic Sciences (B)		Engineering Sciences and Technical Arts (E)						Professional Subjects (P)			
											x			
4. Broad Area	Program ming		Net working		Data base		Web System		Human Computer Interaction		Platform Technolo -gies			
			x											
5. Approval	23rd meeting of the Academic Council , May 2013													

NC1001/ NS1001/ SP1001/ YG1001	NATIONAL CADET CORPS (NCC)/ NATIONAL SERVICE SCHEME (NSS)/ NATIONAL SPORTS ORGANIZATION (NSO) / YOGA	L	T	P	C
	Total Contact Hours – 15 (minimum, but may vary depending on the course)	0	0	1	1
	Prerequisite				
	Nil				
PURPOSE					
To imbibe in the minds of students the concepts and benefits of NCC/NSS/NSO/YOGA and make them practice the same					

INSTRUCTIONAL OBJECTIVES	
1.	To enable the students to gain knowledge about NCC/NSS/NSO/YOGA and put the same into practice

NATIONAL CADET CORPS (NCC)

Any student enrolling as a member of National Cadet Core (NCC) will have to attend sixteen parades out of twenty parades each of four periods over a span of academic year.

Attending eight parades in first semester will qualify a student to earn the credits specified in the curriculum. Grading shall be done based on punctuality, regularity in attending the parades and the extent of active involvement.

NATIONAL SERVICE SCHEME (NSS)

A student enrolling as member of NSS will have to complete 60 hours of training / social service to be eligible to earn the credits specified in the curriculum.

Grading shall be done by the faculty member handling the course based on punctuality, regularity in attending the classes and the extent of active involvement.

NATIONAL SPORTS ORGANIZATION (NSO)

Each student must select one of the following games/sports events and practice for one hour per week. An attendance of 75% is compulsory to earn the credits specified in the curriculum. Grading shall be done by the faculty member handling the course based on punctuality, regularity in attending the classes and the extent of active involvement.

List of games/sports:

Basket Ball, Football, Volley Ball, Ball Badminton, Cricket, Throw-ball, Track events

Field events or any other game with the approval of faculty member.

YOGA

Benefits of Agnai Meditation -Meditation - Agnai, Asanas, Kiriyas, Bandas, Muthras

Benefits of santhi Meditation - Meditation Santhi Physical Exercises (I & II)

Lecture & Practice - Kayakalpa Yoga Asanas, Kiriyas, Bandas, Muthras

Analysis of Thought - Meditation Santhi Physical Exercises III & IV

Benefits of Thuriyam - Meditation Thuriyam Kayakalpa Asanas, Kiriyas, Bandas, Muthras

Attitude - Meditation Thuriyam Kayakalpa Asanas, Kiriyas, Bandas, Muthras