SONA COLLEGE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION)

Junction Main Road, Salem – 636 005.

REGULATIONS 2015

Syllabus for the First Semester B.E./B.Tech. Programmes

(with effect from the academic year 2015 - 2016)

JANUARY 2016

SONA COLLEGE OF TECHNOLOGY, SALEM – 636 005

(An Autonomous Institution)

CHOICE BASED CREDIT SYSTEM (CBCS) - UG

Courses of Study for BE/BTech Semester II under Regulations 2015

Branch: CSE & IT

S.No	Course Code	Course Title	L	T	P	C
1	U15ENG201	Technical English – II *	2	0	2	3
2	U15MAT202	Vector Calculus and Complex Analysis *	3	2	0	4
3	U15PHY203E	Physics of Materials #	3	0	0	3
4	U15CHE204	Environmental Science #	3	0	0	3
5	U15CPR206	Introduction to Data Structures in C#1	3	0	0	3
6	U15EGR207	Engineering Graphics [1]	2	2	0	3
7	U15PCL208	Physics and Chemistry Laboratory – II *2	0	0	2	1
8	U15CPL209	Programming Laboratory II #1	0	0	3	1
9	U15BEEL210	Basic Electrical and Electronics Engineering Laboratory	0	0	3	1
			16	4	10	22
			30 hours			

* - Common to all branches of study.

\# - Common to CSE & IT branches.

#1 - Common to CSE, IT, EEE & ECE

[1] - The examination will be conducted for 3 hours both on theory and lab mode.

[2] - Laboratory classes on alternate weeks for Physics and Chemistry. The lab examination will be conducted separately for 50 marks each with 2 hours duration.

Approved by

Chairman, First Year BE/B.Tech. BoS
Dr. K. Karunakaran

Member Secretary, Academic Council
Dr. A.C. Kaladevi

Chairman, Academic Council & Principal
Dr. V. Jayaprakash

SONA COLLEGE OF TECHNOLOGY, SALEM – 636 005

(An Autonomous Institution)

CHOICE BASED CREDIT SYSTEM (CBCS) - UG

Courses of Study for BE/BTech Semester II under Regulations 2015

Branch : ECE

S.No	Course Code	Course Title	L	T	P	C
1	U15ENG201	Technical English – II *	2	0	2	3
2	U15MAT202	Vector Calculus and Complex Analysis *	3	2	0	4
3	U15PHY203A	Physics For Electrical and Electronics Engineering #	3	0	0	3
4	U15CHE205A	Chemistry For Electrical and Electronics Engineering #	3	0	0	3
5	U15CPR206	Introduction to Data Structures in C #1	3	0	0	3
6	U15EGR207	Engineering Graphics [1]	2	2	0	3
7	U15PCL208	Physics and Chemistry Laboratory – II *2	0	0	2	1
8	U15CPL209	Programming Laboratory II #1	0	0	3	1
9	U15BEEL210	Basic Electrical and Electronics Engineering Laboratory	0	0	3	1
			16	4	10	22
			30 hours			

* - Common to all branches of study.

\# - Common to ECE & EEE branches.

#1 - Common to CSE, IT, EEE & ECE

[1] - The examination will be conducted for 3 hours both on theory and lab mode.

[2] - Laboratory classes on alternate weeks for Physics and Chemistry. The lab examination will be conducted separately for 50 marks each with 2 hours duration

Approved by

Chairman, First Year BE/B.Tech. BoS
Dr. K. Karunakaran

Member Secretary, Academic Council
Dr. A.C. Kaladevi

Chairman, Academic Council & Principal
Dr. V. Jayaprakash

SONA COLLEGE OF TECHNOLOGY, SALEM – 636 005

(An Autonomous Institution)

CHOICE BASED CREDIT SYSTEM (CBCS) - UG

Courses of Study for BE/BTech Semester II under Regulations 2015

Branch : EEE

S.No	Course Code	Course Title	L	T	P	C
1	U15ENG201	Technical English – II *	2	0	2	3
2	U15MAT202	Vector Calculus and Complex Analysis *	3	2	0	4
3	U15PHY203A	Physics For Electrical and Electronics Engineering #	3	0	0	3
4	U15CHE205A	Chemistry For Electrical and Electronics Engineering #	3	0	0	3
5	U15CPR206	Introduction to Data Structures in C #1	3	0	0	3
6	U15ECT207	Electric Circuits Theory	2	2	0	3
7	U15PCL208	Physics and Chemistry Laboratory – II *1	0	0	2	1
8	U15CPL209	Programming Laboratory II #1	0	0	3	1
9	U15ECL210	Electric Circuits Laboratory	0	0	3	1
			16	4	10	22
			30 hours			

* - Common to all branches of study.

\# - Common to ECE & EEE branches.

#1 - Common to CSE, IT, EEE & ECE

*1 - Laboratory classes on alternate weeks for Physics and Chemistry. The lab examination will be conducted separately for 50 marks each with 2 hours duration

Approved by

Chairman, First Year BE/B.Tech. BoS
Dr. K. Karunakaran

Member Secretary, Academic Council
Dr. A.C. Kaladevi

Chairman, Academic Council & Principal
Dr. V. Jayaprakash

SONA COLLEGE OF TECHNOLOGY, SALEM – 636 005

(An Autonomous Institution)

CHOICE BASED CREDIT SYSTEM (CBCS) - UG

Courses of Study for BE/BTech Semester II under Regulations 2015

Branch : MECH

S.No	Course Code	Course Title	L	T	P	C
1	U15ENG201	Technical English – II *	2	0	2	3
2	U15MAT202	Vector Calculus and Complex Analysis *	3	2	0	4
3	U15PHY203B	Physics For Mechanical Engineering	3	0	0	3
4	U15CHE205B	Chemistry For Mechanical Engineering	3	0	0	3
5	U15CPR206	Problem Solving in C #	3	0	0	3
6	U15GE207	Engineering Mechanics	2	2	0	3
7	U15PCL208	Physics and Chemistry Laboratory – II *1	0	0	2	1
8	U15CPL209	Problem Solving in C Laboratory #	0	0	3	1
9	U15CDL210	Computer Aided Drafting Laboratory	0	0	3	1
			16	4	10	22
			30 hours			

* - Common to all branches of study.

\# - Common to CIVIL, MECH & FT.

*1 - Laboratory classes on alternate weeks for Physics and Chemistry. The lab examination will be conducted separately for 50 marks each with 2 hours duration

Approved by

Chairman, First Year BE/B.Tech. BoS
Dr. K. Karunakaran

Member Secretary, Academic Council
Dr. A.C. Kaladevi

Chairman, Academic Council & Principal
Dr. V. Jayaprakash

SONA COLLEGE OF TECHNOLOGY, SALEM – 636 005

(An Autonomous Institution)

CHOICE BASED CREDIT SYSTEM (CBCS) - UG

Courses of Study for BE/BTech Semester II under Regulations 2015

Branch : CIVIL

S.No	Course Code	Course Title	L	T	P	C
1	U15ENG201	Technical English – II *	2	0	2	3
2	U15MAT202	Vector Calculus and Complex Analysis *	3	2	0	4
3	U15PHY203C	Physics For Civil Engineering	3	0	0	3
4	U15CHE205C	Chemistry For Civil Engineering	3	0	0	3
5	U15CPR206	Problem Solving in C #	3	0	0	3
6	U15GE207	Engineering Mechanics	2	2	0	3
7	U15PCL208	Physics and Chemistry Laboratory – II *1	0	0	2	1
8	U15CPL209	Problem Solving in C Laboratory #	0	0	3	1
9	U15CDL210	Computer Aided Drafting Laboratory	0	0	3	1
			16	4	10	22
			30 hours			

* - Common to all branches of study.

\# - Common to CIVIL, MECH & FT.

*1 - Laboratory classes on alternate weeks for Physics and Chemistry. The lab examination will be conducted separately for 50 marks each with 2 hours duration

Approved by

Chairman, First Year BE/B.Tech. BoS
Dr. K. Karunakaran

Member Secretary, Academic Council
Dr. A.C. Kaladevi

Chairman, Academic Council & Principal
Dr. V. Jayaprakash

SONA COLLEGE OF TECHNOLOGY, SALEM – 636 005

(An Autonomous Institution)

CHOICE BASED CREDIT SYSTEM (CBCS) - UG

Courses of Study for BE/BTech Semester II under Regulations 2015

Branch : FT

S.No	Course Code	Course Title	L	T	P	C
1	U15ENG201	Technical English – II *	2	0	2	3
2	U15MAT202	Vector Calculus and Complex Analysis *	3	2	0	4
3	U15PHY203D	Applied Physics	3	0	0	3
4	U15CHE205D	Chemistry For Textile Technology	3	0	0	3
5	U15CPR206	Problem Solving in C #	3	0	0	3
6	U15FTY207	Fiber Science and Technology	2	2	0	3
7	U15PCL208	Physics and Chemistry Laboratory – II *1	0	0	2	1
8	U15CPL209	Problem Solving in C Laboratory #	0	0	3	1
9	U15FTL210	Fiber Analytical Laboratory	0	0	3	1
			16	4	10	22
			30 hours			

* - Common to all branches of study.

\# - Common to CIVIL, MECH & FT.

*1 - Laboratory classes on alternate weeks for Physics and Chemistry. The lab examination will be conducted separately for 50 marks each with 2 hours duration

Approved by

Chairman, First Year BE/B.Tech. BoS
Dr. K. Karunakaran

Member Secretary, Academic Council
Dr. A.C. Kaladevi

Chairman, Academic Council & Principal
Dr. V. Jayaprakash

TECHNICAL ENGLISH II (U15ENG201)

L	T	P	C	M
2	0	2	3	100

Course Objectives

To enable the students to,

1. Use grammatical components effectively in both written and spoken communication
2. Develop speaking skills for self introduction, delivering speeches and technical presentation.
3. Speak effectively in real time and business situations
4. Write emails, formal letters and descriptions of graphics
5. Develop skills for writing reports and proposals

UNIT –I Focus on language

- Cause and effect expressions
- Concord
- If conditionals
- Articles
- Pronouns
- Adverbs
- Grammatical structures

UNIT- II Speaking-I

- Self introduction, personal information, name, home background, study details, area of interest, hobbies, strengths and weaknesses, projects and paper presentations, likes and dislikes in food, travel, clothes, special features of home town.
- Welcome address, vote of thanks, special address on specific topics.

UNIT – III Speaking – II

- Mini presentation in small groups of two or three regarding, office arrangements, facilities, office functions, sales, purchases, training recruitment, advertising, applying for financial assistance, applying for a job, team work, discussion, presentation
- Situational role play between examiner and candidate, teacher and student, customer and sales manager, hotel manager and organiser, team leader and team member, bank manager and candidate, interviewer and applicant, car driver and client, industrialist and candidate, receptionist and appointment seeker, new employee and manager, employee and employee, P.A. and manager, schedule for training, asking for directions, seeking help with office equipment, clarifying an error in the bill, job details, buying a product, selling a product, designing a website, cancelling and fixing appointments, hotel accommodation, training facilities, dress code, conference facilities.

UNIT - IV Writing – I

- Email, fixing an appointment, Cancelling appointments, conference details, hotel accommodation, order for equipment, training programme details, paper submission for seminars and conferences
- Letter Writing, Business communication, quotations, placing orders, complaints, replies to queries from business customers, inviting dignitaries, accepting and declining invitations
- Resume / CV
- Transcoding: Flow Chart, Pie Chart, Graph, Bar Chart, Tabular Column

UNIT – V Writing -II

- Technical report writing, feasibility reports, accident reports, survey reports
- General purpose writing specifications of equipment, description of an object, National and International issues, answering general questions with special emphasis on seeking opinions
- Technical Writing: recommendations, checklists, instructions, note making and memo

- Proposal: establishing a lab, introducing a subject in the curriculum, training programme for students

TOTAL: 45 hours

Textbook

Technical English I & II, Sonaversity, Salem.

Extensive Reading

1. Who Moved my Cheese? – Spencer Johnson-G. P. Putnam's Sons
2. " Discover the Diamond in You" – Arindam Chaudhuri – Vikas Publishing House Pvt. Ltd.

Reference

1. Norman Whitby, Business Benchmark – Pre-Intermediate to Intermediate, Students Book, Cambridge University Press, 2006.
2. A Course in Communication Skills, P. Kiranmai Dutt, Geetha Rajeevan, C. L. N. Prakash, published by Cambridge University Press India Pvt. Ltd.

VECTOR CALCULUS & COMPLEX ANALYSIS (U15MAT202)

L	T	P	C	M
3	2	0	4	100

Course Objectives

To enable the students to,

1. Explain the different types of ordinary differential equations and describe the various methods to solve ordinary differential equations.
2. Define and explain the vector functions, operators and discuss the methods of solving line, surface and volume integrals.
3. State the special features of function of a complex variable, properties and discuss the problems involving conformal mapping.
4. Describe the power series expansion of a complex function and the procedures of evaluating the complex integral.
5. Define Laplace transform, its inverse, properties and solve an ordinary differential equation using Laplace transform.

UNIT I ORDINARY DIFFERENTIAL EQUATIONS 12

Linear higher order ordinary differential equations with constant coefficients, method of variation of parameters, Cauchy's and Legendre's Homogeneous linear ordinary differential equations

UNIT II VECTOR CALCULUS 12

Vector Differentiation: Scalar and vector valued functions, gradient, directional derivative, divergence and curl, scalar potential.

Vector integration: Line, surface and volume integrals, statement of Green's, Stoke's and Gauss divergence theorems, simple applications involving squares, rectangles, cubes and rectangular parallelopiped.

UNIT III ANALYTIC FUNCTIONS 12

Function of a complex variable, Analytic function, necessary conditions and sufficient conditions (excluding proof), properties of an analytic function, harmonic conjugate, construction of an analytic function by Milne's Thomson method. Conformal mapping: $w = z + c$, cz, $1/z$ and bilinear transformation.

UNIT IV COMPLEX INTEGRATION **12**

Statement of Cauchy's integral theorem and Cauchy's integral formula – simple applications – Taylor's and Laurent's expansions - singular points – residues – statement of Cauchy's residue theorem - evaluation of contour integration over unit circle and semi circle (excluding poles on real axis)

UNIT V LAPLACE TRANSFORM **12**

Laplace transform, conditions for existence, transform of elementary functions, basic properties, transform of derivatives and integrals, transform of unit step function and impulse functions, transform of periodic functions

Inverse Laplace transform: Standard results – statement of convolution theorem and its applications, initial and final value theorems, Solution of linear second order ODEs with constant coefficients using Laplace transformation

TOTAL: 60 hours

Text Books

1. Karthikeyan S, Rajeswari R, Senthil Vadivu P, Shivakumar R, "Vector Calculus and Complex Analysis", by Sonaversity, 7th Edition, 2015.
2. Veerarajan.T., "Engineering Mathematics"(I Year), Tata McGraw Hill, 4th Edition, 2011

References

1. Kandasamy P., Thilagavathy K., Gunavathy K., "Engineering Mathematics", (for first year) S.Chand and Co., Ltd., Revised Edition 2011.
2. Erwin Kreyszig., "Advanced Engineering Mathematics", John Wiley and Sons (Wiley student Edition), 10th Edition, 2010.
3. Grewal B.S., "Higher Engineering Mathematics", Khanna Publications, 41st Edition, 2011.
4. Bali N.P., Manish Goyal, "Engineering Mathematics", University Science Press, New Delhi, 9th Edition, 2011.

PHYSICS FOR ELECTRICAL AND ELECTRONICS ENGINEERING
(U15PHY203A)

L	T	P	C	M
3	0	0	3	100

Course Objectives

To enable the students to,

1. Define and explain electrical and thermal conductivity of conducting materials.
2. Explain the theory of semi-conducting materials and its applications.
3. Explain the properties and applications of magnetic and superconducting materials.
4. Explain polarization process in dielectric materials and their temperature and frequency dependence and the causes of dielectric breakdown.
5. Recognize the novel properties of new engineering materials.

UNIT I CONDUCTING MATERIALS 9

Conductors – classical free electron theory of metals – Electrical and thermal conductivity – Wiedemann – Franz law – Lorentz number – Draw backs of classical theory – Quantum theory –band theory of solids (qualitative treatment only) - Fermi distribution function – Effect of temperature on Fermi Function – Density of energy states – carrier concentration in metals – conducting materials in thermal relay and themostats.

UNIT II SEMICONDUCTING MATERIALS 9

Intrinsic semiconductors – Energy band diagram – direct and indirect band gap semiconductors - Carrier concentration in intrinsic semiconductors - Fermi level – Variation of Fermi level with temperature – Electrical conductivity – Band gap determination – Extrinsic semiconductors – Carrier concentration in N-type and P-type semiconductors (Qualitative Treatment only) – Variation of Fermi level with temperature and impurity concentration – Compound semiconductors – Hall effect – Determination of Hall coefficient – Hall effect applications – Ohmic contacts – Schottky diode.

UNIT III MAGNETIC AND SUPERCONDUCTING MATERIALS 9

Origin of magnetic moment – Bohr magneton – Dia and para and Ferromagnetic materials – Domain theory – Hysteresis – Soft and hard magnetic materials – Ferrites – applications of ferrites in telecommunication, radar and magnetic hard disc.

Superconductivity - Properties - Types of super conductor – BCS theory of superconductivity (Qualitative) - High Tc superconductors – Applications of superconductors: SQUID, cryotron, magnetic levitation in trains.

UNIT IV DIELECTRIC MATERIALS 9

Electrical susceptibility – Dielectric constant – Electronic, ionic, orientational and space charge polarization – Frequency and temperature dependence of polarization – Internal field – Clausius – Mosotti relation (derivation) – Physical significance of Maxwell's equations - Dielectric loss – Dielectric breakdown – Uses of dielectric materials in capacitor and transformer – application of dielectrics in microwave oven and dielectric strain gauge.

UNIT V NEW ENGINEERING MATERIALS 9

Metallic glasses - preparation, properties and applications.

Shape memory alloys (SMA) - characteristics, properties of NiTi alloy, applications, advantages and disadvantages of SMA

Nanoscience and Nanotechnology – significance of the nanoscale - different types of nanostructures (Confinement Dimensions 0-D, 1-D, 2-D and 3-D) - Categories of nanomaterials - Fabrication of nonomaterials - Ball milling method and Chemical vapour deposition technique - Carbon nanotubes - Types of carbon nanotubes - CNT structure – properties and applications.

Biomaterials (metals and alloys, ceramics) - classification and applications.

TOTAL: 45 hours

Text books

1. Physics for Electrical and Electronics Engineering, Sonaversity, Sona College of Technology, Salem (Revised edition, 2015).
2. M. Arumugam, 'Materials Science' Anuradha Publications, Kumbakonam, (2006).

References

1. B. K. Pandey and S. Chaturvedi, Engineering Physics , Cengage Learning India Pvt. Ltd., Delhi, 2012.
2. Rajendran, V, and Marikani A, 'Materials science' TMH Publications, (2004) New Delhi.
3. Jayakumar, S. 'Materials science', R.K. Publishers, Coimbatore, (2008).
4. Palanisamy P.K, 'Materials science', Scitech Publications (India) Pvt. Ltd., Chennai, Second Edition (2007)
5. Charles P. Poole and Frank J. Ownen, 'Introduction to Nanotechnology', Wiley India (2007) (Unit V)

PHYSICS FOR MECHANICAL ENGINEERING (U15PHY203B)

L	T	P	C	M
3	0	0	3	100

Course Objectives

To enable the students to,

1. Define the various moduli of elasticity and explain streamline and turbulent flow of liquid and apply Poiseuille's formula to determine the coefficient of viscosity of a liquid.
2. Describe experimental methods to determine thermal conductivity and state the laws of thermodynamics and their applications in the field of Engineering.
3. Define and explain electrical and thermal conductivity of conducting materials.
4. Explain the theory of semi-conducting materials and its applications.
5. Recognize the novel properties of new engineering materials.

UNIT I PROPERTIES OF MATTER AND HYDRODYNAMICS 9

Elasticity - Poisson's ratio and relation between moduli (qualitative) - Stress-strain diagram- Factors affecting elasticity - Bending of beams - Cantilever - expression for bending moment – Measurement of Young's modulus by uniform and non-uniform bending - I shaped girders - Stream line flow - Turbulent flow- Poiseuille's formula for flow of liquid through a capillary tube – Determination of coefficient of viscosity of a liquid.

UNIT II HEAT AND THERMODYNAMICS 9

Thermal conductivity - Forbe's and Lee's disc methods- Radial and cylindrical flow of heat -Thermal conductivity of rubber and glass - Thermal insulation of buildings - Thermal insulating materials - Thermal equilibrium - Zeroth law of thermodynamics - Internal Energy - First law of thermodynamics - Indicator diagram - Isothermal process - Work done in an isothermal expansion - Adiabatic process - Work done in an adiabatic expansion – Reversible and irreversible processes - Second law of thermodynamics - Carnot engine - Efficiency of Canot's cycle - Carnot's cycle as heat engine and refrigerator - Carnot's theorem - Comparative study of Ideal Otto and diesel engines and their efficiency (no derivation) - Entropy - temperature diagram of Carnot's cycle.

UNIT III CONDUCTING MATERIALS **9**

Conductors - classical free electron theory of metals - Electrical and thermal conductivity - Wiedemann-Franz law - Lorentz number - Drawbacks of classical theory - Quantum theory -band theory of solids(qualitative treatment only) - Fermi distribution function - Effect of temperature on Fermi Function - Density of energy states - Carrier concentration in metals - application of conducting materials in induction furnace.

UNIT IV SEMICONDUCTING MATERIALS **9**

Intrinsic semiconductors – Energy band diagram – direct and indirect band gap semiconductors -Carrier concentration in intrinsic semiconductors - Fermi level – Variation of Fermi level with temperature – Electrical conductivity – Band gap determination – Extrinsic semiconductors – Carrier concentration in N-type and P-type semiconductors (Qualitative Treatment only) – Variation of Fermi level with temperature and impurity concentration – Compound semiconductors – Hall effect – Determination of Hall coefficient – Hall effect applications - application of semiconductors in strain measurements.

UNIT V NEW ENGINEERING MATERIALS **9**

Metallic glasses: Preparation - properties - applications

Shape memory alloys: Characterisitics - properties of Ni-Ti alloy – application-advantages and disadvantages of SMA

Advanced Ceramics: Introduction – characteristics – structural ceramics

Nanoscience and Nanotechnology – significance of the nanoscale - different types of nanostructures (Confinement Dimensions 0-D, 1-D, 2-D and 3-D) - Categories of nanomaterials - Fabrication of nonomaterials - Ball milling method and Chemical vapour deposition technique - Carbon nanotubes - Types of carbon nanotubes - CNT structure – properties and applications.

TOTAL: 45 hours

Text books

1. Physics for Mechanical Engineering, Sonaversity, Sona College of Technology, Salem (Revised edition, 2015).
2. M. Arumugam, ‘Materials Science’ Anuradha Publications, Kumbakonam, (2006).

References

1. B. K. Pandey and S. Chaturvedi, 'Engineering Physics ', Cengage Learning India Pvt. Ltd., Delhi, 2012.
2. Rajendran, V, and Marikani A, 'Materials science' TMH Publications, (2004) New Delhi
3. Jayakumar, S. 'Materials science', R.K. Publishers, Coimbatore, (2008).
4. Subramaniam. N, Brijlal, ' Heat and Thermodynamics', S. Chand Group, New Delhi (2007). (Unit II)
5. Subramaniam. N, Brijlal, ' Properties of Matter', S. Chand Group, New Delhi (2007) (Unit I)
6. Charles P. Poole and Frank J. Ownen, 'Introduction to Nanotechnology', Wiley India (2007) (Unit V)

PHYSICS FOR CIVIL ENGINEERING (U15PHY203B)

L	T	P	C	M
3	0	0	3	100

Course Objectives

To enable the students to,

1. Define the various moduli of elasticity and describe streamline and turbulent flow of liquid and apply Poiseuille's formula to determine the coefficient of viscosity of a liquid.
2. Define and explain electrical and thermal conductivity of conducting materials.
3. Explain the theory of propagation of heat and its application.
4. Analyse stress distribution in solids using strain measuring techniques.
5. Recognize the novel properties of new engineering materials.

UNIT I PROPERTIES OF MATTER AND HYDRODYNAMICS 9

Elasticity - Poisson's ratio and relation between moduli (qualitative) – Stress-strain diagram- Factors affecting elasticity - Bending of beams – Cantilever - Expression for bending moment – Measurement of Young's modulus by uniform and non-uniform bending- I shaped girders - Stream line flow – Turbulent flow- Poiseuille's formula for flow of liquid through a capillary tube – Determination of coefficient of viscosity of a liquid.

UNIT II CONDUCTING MATERIALS 9

Conductors - Classical free electron theory of metals - Electrical and thermal conductivity - Wiedemann-Franz law - Lorentz number - Drawbacks of classical theory - Quantum theory-band theory of solids(qualitative treatment only) – Fermi distribution function - Effect of temperature on Fermi Function - Density of energy states - Carrier concentration in metals – application of conducting materials in electrically conductive concrete.

UNIT III THERMAL PHYSICS 9

Modes of heat transfer – conduction - convection – radiation - Coefficient of thermal conductivity - Thermal diffusivity - Rectilinear flow of heat along a bar (derivation) – Radial and cylindrical flow of heat, Spherical shell method - Thermal conductivity of

rubber and glass tube - Conduction through compound media – Thermal insulation in buildings - Thermal insulating materials – Green building concept.

UNIT IV STRAIN MEASURING TECHNIQUES **9**

Stress – Strain – Electrical strain gauges – Resistance, capacitance , Inductance , Wheatstone bridge – Theory of photoelasticity - Stress optic law – Effect of stressed model in a plane polariscope –Isoclinic and Isochromatic fringes – Photo elastic bench.

UNIT V NEW ENGINEERING MATERIALS **9**

Metallic glasses: Preparation - properties - applications

Shape memory alloys: Characterisitics - properties of Ni-Ti alloy – application-advantages and disadvantages of SMA

Advanced Ceramics: Introduction – characteristics – structural ceramics

Nanoscience and Nanotechnology – significance of the nanoscale - different types of nanostructures (Confinement Dimensions 0-D, 1-D, 2-D and 3-D) - Categories of nanomaterials - Fabrication of nonomaterials - Ball milling method and Chemical vapour deposition technique - Carbon nanotubes - Types of carbon nanotubes - CNT structure – properties and applications.

TOTAL: 45 hours

Text books

1. Physics for Civil Engineering, Sonaversity, Sona College of Technology, Salem (Revised edition, 2015).
2. Arumugam M, ‘Materials Science’ Anuradha Publications, Kumbakonam, (2006).

References

1. B. K. Pandey and S. Chaturvedi, ‘Engineering Physics ‘, Cengage Learning India Pvt. Ltd., Delhi, 2012.
2. Rajendran, V, and Marikani A, ‘Materials Science’ TMH Publications, (2004) New Delhi

3. Subramaniam. N, Brijlal, ‘ Heat and Thermodynamics ‘, S. Chand Group, New Delhi (2007). (Unit II)
4. Subramaniam. N, Brijlal, ‘ Properties of Matter’, S. Chand Group, New Delhi (2007). (Unit I)
5. Jayakumar, S. ‘Materials Science’, R.K. Publishers, Coimbatore, (2008)6. 6.
6. Arumugam M, ‘Engineering Physics’ Anuradha Publications, Kumbakonam, (2004).
7. Charles P. Poole and Frank J. Ownen, ’Introduction to Nanotechnology’, Wiley India (2007) (Unit V)

APPLIED PHYSICS (U15PHY203D)

L	T	P	C	M
3	0	0	3	100

Course Objectives:

To enable students to,

1. Define the various moduli of elasticity and explain elastic, inelastic and visco-elastic behaviour of materials.
2. Define and explain electrical and thermal conductivity of conducting materials.
3. Explain the properties of magnetic and superconducting materials.
4. Explain polarization process in dielectric materials and their temperature and frequency dependence and the causes of dielectric breakdown.
5. Recognize the novel properties of phase change materials and nanomaterials.

UNIT I ELASTIC PROPERTIES OF MATERIALS 9

Elasticity - Poisson's ratio and relation between moduli (qualitative) - Stress-strain diagram - Factors affecting elasticity - Bending of beams - Expression for bending moment - Measurement of Young's modulus by uniform bending method - Torsional pendulum - Determination of Rigidity modulus of a wire.

Elastic, Inelastic and Viscoelastic behavior

Elastic behavior- idea of atomic model, idea of modulus as a parameter of design, rubber like elasticity, Inelastic behaviour-relaxation process, visco-elastic behaviour-introduction to spring dashpot model

UNIT II CONDUCTING MATERIALS 9

Conductors – Classical free electron theory of metals – Electrical and thermal conductivity – Wiedemann – Franz law – Lorentz number – Draw backs of classical theory – Quantum theory – band theory of solids (qualitative treatment only) - Fermi distribution function – Effect of temperature on Fermi Function – Density of energy states – Carrier concentration in metals – Electrically conductive textiles.

UNIT III MAGNETIC AND SUPERCONDUCTING MATERIALS 9

Origin of magnetic moment – Bohr magneton – Dia and para and ferromagnetic materials – Domain theory – Hysteresis – Soft and hard magnetic materials – Ferrites – applications – Magnetic hard disc.

Superconductivity - Properties - Types of super conductor – BCS theory of superconductivity(Qualitative) - High Tc superconductors – Applications of superconductors : SQUID, cryotron, magnetic levitation in trains.

UNIT IV DIELECTRIC MATERIALS 9

Electrical susceptibility – Dielectric constant – Electronic, ionic, orientational and space charge polarization – Frequency and temperature dependence of polarization – Internal field – Clausius – Mosotti relation (derivation) – Physical significance of Maxwell's equations - Dielectric loss – Dielectric breakdown – Uses of dielectric materials (capacitor and transformer) .

UNIT V NEW ENGINEERING MATERIALS 9

Phase change materials - Basic information of phase change materials - Phase change technology-PCM in textiles.

Shape memory polymers (SMPs) – Introduction and applications.

Nanoscience and Nanotechnology – significance of the nanoscale - different types of nanostructures (Confinement Dimensions 0-D, 1-D, 2-D and 3-D) - Categories of nanomaterials - Fabrication of nonomaterials - Ball milling method and Chemical vapour deposition technique - Carbon nanotubes - Types of carbon nanotubes - CNT structure – properties and applications.

TOTAL: 45 hours

Text books

1. 'Applied Physics', Sonaversity, Sona College of Technology, Salem (Revised edition, 2015).
2. M. Arumugam, 'Materials Science' Anuradha Publications, Kumbakonam, (2006).

References

1. Subramaniam. N, Brijlal, ‘ Properties of Matter’, S. Chand Group, New Delhi (2007) (Unit I)
2. B. K. Pandey and S. Chaturvedi, Engineering Physics , Cengage Learning India Pvt. Ltd., Delhi, 2012.
3. Rajendran, V, and Marikani A, ‘Materials science’ TMH Publications, (2004) New Delhi.
4. Jayakumar, S. ‘Materials science’, R.K. Publishers, Coimbatore, (2008).
5. Charles P. Poole and Frank J. Ownen, ’Introduction to Nanotechnology’, Wiley India (2007) (unit V)

PHYSICS OF MATERIALS (U15PHY203E)

L	T	P	C	M
3	0	0	3	100

Course Objectives

To enable students to,

1. Define and explain electrical and thermal conductivity of conducting materials.
2. Explain the theory of semi-conducting materials and its applications.
3. Explain the magnetic principle in computer data storage.
4. Describe the optical data storage techniques
5. Recognize the novel properties of nanomaterials and explain the quantum confinement phenomenon..

UNIT I ELECTRICAL PROPERTIES OF MATERIALS 9

Conductors – Classical free electron theory of metals – Electrical and thermal conductivity – Wiedemann – Franz law – Lorentz number – Draw backs of classical theory – Quantum theory –band theory of solids (qualitative treatment only) - Fermi distribution function – Effect of temperature on Fermi Function – Density of energy states – Carrier concentration in metals.

UNIT II SEMICONDUCTORS PHYSICS 9

Intrinsic semiconductors – Energy band diagram – direct and indirect band gap semiconductors -Carrier concentration in intrinsic semiconductors - Fermi level – Variation of Fermi level with temperature – Electrical conductivity – Band gap determination – Extrinsic semiconductors – Carrier concentration in N-type and P-type semiconductors (Qualitative Treatment only) – Variation of Fermi level with temperature and impurity concentration – Compound semiconductors – Hall effect – Determination of Hall coefficient – Hall effect applications – Ohmic contacts – Schottky diode.

UNIT III MAGNETIC PROPERTIES OF MATERIALS 9

Classification of magnetic materials – Quantum numbers – Magnetic moment – Classical theory of diamagnetism (Langevin theory) – Theory of paramagnetism – Ferromagnetism (Weiss theory) – Anti ferromagnetic materials – Ferrites – Hard and soft magnetic materials – Magnetic recording materials – Bubble memory – Magnetic principle in computer data storage – Magnetic tape – Floppy disc – Magnetic hard disc.

UNIT IV OPTICAL PROPERTIES OF MATERIALS **9**

Classification of optical materials – Absorption in metals, insulators & Semiconductors - LED's – Organic LED's – Polymer light emitting materials – Plasma light emitting devices – LCD's –Optical data storage techniques in DVD and Blue -ray disc - Holographic data storage.

UNIT V NANO MATERIALS **9**

Nanoscience and Nanotechnology – significance of the nanoscale – Quantum confinement effect - different types of nanostructures (Confinement Dimensions 0-D, 1-D, 2-D and 3-D) – Categories of nanomaterials – Fabrication of nonomaterials – Ball milling method and Chemical vapour deposition technique - Quantum size effect in metal or semiconductor nanoparticles - Quantum structures – Metal-to-insulator transition – Confining excitons – Band gap of nanomaterials –Tunneling – Resonant Tunneling Diodes (RTD's) – Single electron phenomena – Single electron transistor – Basic concepts of spintronics.

TOTAL: 45 hours

Text books

1. 'Physics of Materials', Sonaversity, Sona College of Technology, Salem (Revised edition, 2015).
2. P.K. Palanisamy, "Materials Science", Scitech, 2003.

References

1. S.O. Kasap, "Principles of Electronic Materials and Devices", Tata McGraw-Hill, 2007.
2. R.F. Pierret, "Semiconductor Device Fundamentals", Pearson, 1996.
3. N. Garcia and A. Damask, "Physics for Computer Science Students", Springer-Verlag, 1991.
4. S. Datta, "Quantum Transport: Atom to Transistor", Cambridge University Press, 2005.
5. B. K. Pandey and S. Chaturvedi, Engineering Physics , Cengage Learning India Pvt. Ltd., Delhi, 2012.

ENVIRONMENTAL SCIENCE (U15CHE204)

L	T	P	C	M
3	0	0	3	100

Course Objectives

To enable students to,

- State the importance of the acute need for environmental awareness and discuss significant aspects of natural resources like forests, water, mineral, food, energy and land resources.
- Explain the concepts of an ecosystem and provide an overview of biodiversity and its conservation.
- Define the various known kinds of environmental pollution and discuss their causes, effects and control measures.
- Describe the safe disposal of hazardous wastes and waste water treatment.
- Give an account of the social issues with regard to the environment.
- Discuss the impact of human population on the environment.

UNIT I INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES 12

Definition, Scope and Importance – Need for public awareness – Forest Resources:- Use and over - exploitation, deforestation, Case Studies, Timber Extraction, Dams, Benefits and their effects on forests and tribal people - Water Resources:- Use and Over-Utilization of Surface and ground water , Floods, Drought, Conflicts Over Water – Mineral Resources:- Use–Environmental Effects of Extracting and Using Mineral Resources – Food Resources: World Food Problems, Changes caused by Agriculture and Overgrazing, Effects of Modern Agriculture, Fertilizer- Pesticide Problems, Water Logging, salinity – Energy Resources:- Growing Energy Needs, Renewable and Non Renewable Energy Sources, Use of Alternate Energy Sources – Land Resources:- Land as a Resource, Land Degradation, Man Induced Landslides, Soil Erosion and Desertification – Role of an Individual in Conservation of Natural Resources.

UNIT II ECOSYSTEMS AND BIODIVERSITY 9

Concepts of an Ecosystem – Structure and Function of an Ecosystem – Producers,

Consumers and Decomposers – Energy Flow in the Ecosystem – Biogeochemical Processes - Ecological Succession – Food Chains, Food Webs and Ecological Pyramids.

Introduction to Biodiversity – Definition: Genetic, Species and Ecosystem Diversity – Value of Biodiversity: Consumptive Use, Productive Use, Social, Ethical, Aesthetic and Option Values – Biodiversity at Global, National and Local Levels – India as a Mega-Diversity Nation – Hot-Spots of Biodiversity – Threats to Biodiversity: Habitat Loss, Poaching of Wildlife, Man-Wildlife Conflicts – endangered and Endemic Species of India – Conservation of Biodiversity: In-Situ and Ex-Situ conservation of Biodiversity.

UNIT III ENVIRONMENTAL POLLUTION 10

Definition – Causes, Effects and Control Measures of:- (A) Air Pollution - Climate Change, Global Warming, Acid Rain, Ozone Layer Depletion (B) Water Pollution (C) Soil Pollution (D) Marine Pollution (E) Noise Pollution (F) Thermal Pollution (G) Nuclear Hazards – Solid Waste Management:- Causes, Effects and Control Measures of Urban and Industrial Wastes, hazardous wastes and biomedical wastes – Role of an Individual in Prevention of Pollution – Pollution Case Studies – disaster Management:- Floods, Earthquake, Cyclone and Landslides, Waste water treatment methods, Green chemistry – principles and applications, Industrial safety measures – storage, handling and compatibility methods.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT 8

Sustainable Development – Urban Problems Related To energy – Water conservation, Rain Water Harvesting, Watershed Management – Resettlement and Rehabilitation of People, its Problems and Concerns – Environmental Ethics:- Issues and Possible Solutions –, Nuclear Accidents and Holocaust, Case Studies – Wasteland Reclamation – Environment Production Act – Air (Prevention and Control of Pollution) Act – Water (Prevention and Control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Issues Involved in enforcement of Environmental Legislation – Public Awareness.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT 6

Population Growth, Variation Among Nations – Population Explosion – Family Welfare Programme – environment and Human Health – Human Rights – Value Education – HIV /AIDS – Women and Child Welfare – Role of Information Technology in Environment and Human Health – Case Studies.

TOTAL : 45 hours

Text Books

1. K. Karunakaran et al., "Environmental Science" Sonaversity, Sona College of Technology, Salem, 2016.
2. "Environmental Science and Engineering" by Anubha Kaushik and Kaushik, New Age International Publication, 4th Multicolour Edition, New Delhi, 2014.

Reference Books

1. Masters, G.M., "Introduction to Environmental Engineering and Science", Pearson Education Pvt., Ltd., 2nd Edition, 2004.
2. Miller, T.G. Jr., "Environmental Science", Wadsworth Pub. Co.
3. Erach, B., "The Biodiversity of India", Mapin Publishing P.Ltd.,Ahmedabad, India.
4. Erach Bharucha, "Textbook of Environmental Studies for Undergraduate Courses", 2005, University Grands Commission, Universities Press India Private Limited, Hyderguda, Hyderabad – 500029.

CHEMISTRY FOR ELECTRICAL AND ELECTRONICS ENGINEERING (U15CHE205A)

L	T	P	C	M
3	0	0	3	100

OBJECTIVES

To enable students to,

- Principles of polymer chemistry and engineering applications of polymers
- Fabrication, working principle and applications of energy devices
- Chemistry of electronic materials
- Electrochemical processes in electronic industries
- Photochemistry and Spectroscopy

UNIT I POLYMER CHEMISTRY **9**

Introduction - Classification of polymers – Natural and synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerization. Types of polymerization: Addition condensation and copolymerization, Properties of polymers: Tg, Tacticity, Molecular weight – weight average, number average and polydispersity index. Techniques of polymerization: Bulk, emulsion, solution and suspension. Preparation, properties and uses of PVC, Polyethylene, Nylon 6,6, Bakelite and Epoxy resin, Rubbers – types – vulcanization of rubber - Polymer processing - compounding , compression, injection, and blow moulding techniques.

UNIT II MODERN ENERGY DEVICES FOR ELECTRONIC APPLIANCES **9**

Types of batteries, battery characteristics - voltage, current, capacity, electricity storage density, power, discharge rate, cycle life, energy efficiency and shelf life. Fabrication and working of dry cell, lead- acid battery, Ni - Cd and Lithium ion batteries. Fuel cells – hydrogen-oxygen, carbonaceous, methanol and proton exchange membrane fuel cells. Application of nano materials in energy storage devices – nano batteries – applications.

UNIT III CHEMISTRY OF ELECTRONIC MATERIALS **9**

Organic Semiconducting materials – principle and advantanges - p-type and n-type semiconducting materials - pentacene – fullerenes-C-60; organic dielectric material – definition, examples – polystyrene – PMMA; organic light emitting polymer – polythiopene, conducting polymer – types: intrinsic , extrinsic and doped conducting

polymers; applications - Principle and applications of organic light emitting diodes (OLEDs), organic transistors.

UNIT IV ELECTROCHEMICAL PROCESSES IN ELECTRONIC INDUSTRIES 9

Electroplating – Principle and process - plating parameters- current and energy efficiency - Electroplating of Cu, Ni, and Cr. Fundamentals of electroless deposition – Ni and Cu electroless plating, fabrication of PCB's - Electrochemical etching of copper from PCBs - Anodizing - Definition, Principle and applications - Chemical sensors - optical and heat sensors – definitions and applications, Applications of Chemistry in electrical and electronics engineering.

UNIT V PHOTOCHEMISTRY AND SPECTROSCOPY 9

Photochemistry: Laws of photochemistry - Grotthuss–Draper law, Stark–Einstein law and Lambert- Beer Law. Quantum efficiency – determination- Photo processes - Fluorescence, Phosphorescence, Chemiluminescence and Photo-sensitization. Spectroscopy: Electromagnetic spectrum - Absorption of radiation – Electronic, Vibrational and rotational transitions. UV-Visible and IR spectroscopy – principles, instrumentation (Block diagram only) and applications.

TOTAL: 45 hours

Text Books

1. K. Karunakaran et al., "Chemistry For Electrical and Electronics Engineering" Sonaversity, Sona College of Technology, Salem, 2016.
2. P.C.Jain and Monica Jain, "Engineering Chemistry" Dhanpat Rai Pub, Co., New Delhi , 2010.

Reference Books

1. Gowariker V.R. , Viswanathan N.V. and JayadevSreedhar, "Polymer Science", New Age International P (Ltd.,), Chennai, 2006.
2. B. Sivasankar, "Engineering Chemistry", Tata McGraw-Hill Pub. Co. Ltd., New Delhi (2008).

3. Electroplating, Anodizing and Metal treatment", Hand book, NIIR board, 2004.
4. Pletcher D, "Industrial Electrochemistry", Chapman and Hall, London, 1993.
5. Hagen Klauk, "Organic Electronics: Materials, Manufacturing and Applications", Wiley-VCH, 2006.
6. Douglas A Skoog, Donald M West, James Holler F Stanley, R Crouch, " Fundamentals Of Analytical Chemistry", Thomson learning, 2006.

CHEMISTRY FOR MECHANICAL ENGINEERING (U15CHE205B)

L	T	P	C	M
3	0	0	3	100

OBJECTIVES

To enable students to,

- The principles of polymer chemistry and engineering applications of polymers
- Chemistry of Engineering Materials
- Chemistry of Fuels
- Industrial importance of Phase rule and alloys
- Metallurgical processes

UNIT I POLYMER CHEMISTRY 9

Introduction - Classification of polymers – Natural and synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerization. Types of polymerization: Addition condensation and copolymerization, Properties of polymers: Tg, Tacticity, Molecular weight – weight average, number average and polydispersity index. Techniques of polymerization: Bulk, emulsion, solution and suspension. Preparation, properties and uses of PVC, Polyethylene, Nylon 6,6, Bakelite and Epoxy resin, Rubbers – types – vulcanization of rubber - Polymer processing - compounding , compression, injection, and blow moulding techniques.

UNIT II CHEMISTRY OF ENGINEERING MATERIALS 9

Refractories – classification – acidic, basic and neutral refractories – properties (refractoriness, refractoriness under load, dimensional stability, porosity, thermal spalling).

Abrasives – natural and synthetic abrasives – quartz, corundum, emery, garnet, diamond, silicon carbide and boron carbide.

Lubricants – mechanism of lubrication, liquid lubricants, - properties – (viscosity index, flash and fire points, cloud and pour points, oiliness) – solid lubricants – graphite and molybdenum sulphide.

Modern Composite Materials – Definition, constituents – FRP - types and engineering applications.

UNIT III FUELS **9**

Fuels – calorific value – gross and net calorific values – coal – proximate and ultimate analyses – metallurgical coke – manufacture by Otto-Hoffmann method – Petroleum processing and fractions – cracking – types – synthetic petrol – Bergius and Fischer Tropsch processes - knocking – octane number and cetane number – power alcohol – biodiesel – Gaseous fuels – Water gas, producer gas, CNG and LPG, Combustion – flue gas analysis by Orsat's method.

UNIT – IV PHASE RULE AND ALLOYS **9**

Statement and explanation of terms involved – one component system – water system – condensed phase rule – construction of phase diagram by thermal analysis – simple eutectic systems (lead – silver system only).

Alloys: Introduction- Definition- Properties of alloys- Significance of alloying, Functions and effect of alloying elements - ferrous alloys – nichrome and stainless steel – heat treatment of steel, non-ferrous alloys – brass and bronze.

Unit – V METALLURGY **9**

Metallurgy – extraction of metals from its ores – froth floatation, electromagnetic separation and chemical methods – refining of metals – liquation and electrolytic refining methods – metallurgy of iron and nickel - Powder metallurgy – principle – characteristics of metal powders – methods of producing metal powders (mechanical pulverization, atomization, chemical reduction, electrolytic process, decomposition) – mixing and blending – compacting – sintering – applications, advantages and limitations of powder metallurgy, Applications of Chemistry in mechanical engineering.

TOTAL: 45 hours

Text Books

1. K. Karunakaran et al., "Chemistry For Mechanical Engineering" Sonaversity, Sona College of Technology, Salem, 2016.
2. P.C.Jain and Monica Jain, "Engineering Chemistry" Dhanpat Rai Pub, Co., New Delhi , 2010.

Reference Books

1. Gowariker V.R. , Viswanathan N.V. and JayadevSreedhar, “Polymer Science”, New Age International P (Ltd.,), Chennai, 2006
2. B. Sivasankar, “Engineering Chemistry”, Tata McGraw-Hill Pub. Co. Ltd., New Delhi (2008).
3. B.K. Sharma, “Engineering Chemistry”, Krishna Prakasan Media (P) Ltd., Meerut (2001).
4. N. Krishnamurthy, K. Jeyasubramanian and P. Vallinayagam, “Applied Chemistry”, Tata McGraw-Hill Publishing Company Limited, New Delhi (1999).

CHEMISTRY FOR CIVIL ENGINEERING (U15CHE205C)

L	T	P	C	M
3	0	0	3	100

OBJECTIVES

To enable students to,

- The principles of polymer chemistry and engineering applications of polymers
- Chemistry of Engineering Materials
- Modern Composite Materials
- Industrial importance of Phase rule and alloys
- Chemistry of Building Materials

UNIT I POLYMER CHEMISTRY 9

Introduction - Classification of polymers – Natural and synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerization. Types of polymerization: Addition condensation and copolymerization, Properties of polymers: Tg, Tacticity, Molecular weight – weight average, number average and polydispersity index. Techniques of polymerization: Bulk, emulsion, solution and suspension. Preparation, properties and uses of PVC, Polyethylene, Nylon 6,6, Bakelite and Epoxy resin, Rubbers – types – vulcanization of rubber - Polymer processing - compounding , compression, injection, and blow moulding techniques.

UNIT II CHEMISTRY OF ENGINEERING MATERIALS 9

Refractories – classification – acidic, basic and neutral refractories – properties (refractoriness, refractoriness under load, dimensional stability, porosity, thermal spalling).

Abrasives – natural and synthetic abrasives – quartz, corundum, emery, garnet, diamond, silicon carbide and boron carbide.

Lubricants – mechanism of lubrication, liquid lubricants, - properties – (viscosity index, flash and fire points, cloud and pour points, oiliness) – solid lubricants – graphite and molybdenum sulphide.

UNIT – III MODERN COMPOSITE MATERIALS **9**

Blends and composites, significance and choice of polymers for blending, polymer alloys, plastic-plastic, rubber-plastic and rubber-rubber blends, FRP – composition and application of glass , carbon, boron, alumina and aramid FPRs. Reinforcement – Particle reinforced composites (PRC) – Composition and application of clay, silica , carbon , TiO_2 and metal nanostructured materials in PRC.

UNIT – IV PHASE RULE AND ALLOYS **9**

Statement and explanation of terms involved – one component system – water system – condensed phase rule – construction of phase diagram by thermal analysis – simple eutectic systems (lead – silver system only).

Alloys: Introduction- Definition- Properties of alloys- Significance of alloying, Functions and effect of alloying elements - ferrous alloys – nichrome and stainless steel – heat treatment of steel, non-ferrous alloys – brass and bronze.

Unit – V CHEMISTRY OF BUILDING MATERIALS **9**

Lime – classification – manufacture and properties of lime – Cement – classification – Portland cement – chemical composition – manufacture – setting and hardening – analysis of cement – concretes – weathering of concrete, cement and its prevention – special cements - gypsum – plaster of Paris – Glass - manufacture, types, properties and uses - green building – definition and features, Applications of Chemistry in civil engineering.

TOTAL: 45 hours

Text Books

1. K. Karunakaran et al., “Chemistry for Civil Engineering” by Sonaversity, Sona College of Technology, Salem, New Edition 2016.
2. P.C.Jain and Monica Jain, “Engineering Chemistry” Dhanpat Rai Pub, Co., New Delhi , 2010.

Reference Books

1. Gowariker V.R. , Viswanathan N.V. and JayadevSreedhar, “Polymer Science”, New Age International P (Ltd.,), Chennai, 2006
2. B. Sivasankar, “Engineering Chemistry”, Tata McGraw-Hill Pub. Co. Ltd., New Delhi (2008).
3. B.K. Sharma, “Engineering Chemistry”, Krishna Prakasan Media (P) Ltd., Meerut (2001).
4. N. Krishnamurthy, K. Jeyasubramanian and P. Vallinayagam, “Applied Chemistry”, Tata McGraw-Hill Publishing Company Limited, New Delhi (1999).

CHEMISTRY FOR TEXTILE TECHNOLOGY (U15CHE205D)

L	T	P	C	M
3	0	0	3	100

OBJECTIVES

To enable students to,

- The principles of polymerization and its applications
- Basic concepts of chemical bonding
- Instrumental methods of analysis and their importance
- Applications of Organic compounds in Textile Industry
- Applications of Inorganic compounds in Textile Industry

UNIT I POLYMER CHEMISTRY 9

Introduction - Classification of polymers – Natural and synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerization. Types of polymerization: Addition condensation and copolymerization, Properties of polymers: Tg, Tacticity, Molecular weight – weight average, number average and polydispersity index. Techniques of polymerization: Bulk, emulsion, solution and suspension. Preparation, properties and uses of PVC, Polyethylene, Nylon 6,6, Bakelite and Epoxy resin, Rubbers – types – vulcanization of rubber - Polymer processing - compounding , compression, injection, and blow moulding techniques.

UNIT II CHEMICAL BONDING 9

Types of bond – van der waals (or) intermolecular forces – types – hydrogen bond – types, Valence Bond Theory (VBT) – VSEPR Theory - Molecular Orbital Theroy – Linear Combination of Atomic Orbitals (LCAO method)- energy level diagram of molecular orbitals (nitrogen and oxygen only) – coordinate bond – metallic bond.

UNIT III INSTRUMENTAL METHODS OF ANALYSIS 9

Beer-Lambert's law – UV-Visible spectroscopy, Colourimetry – principles and instrumentation - Estimation of Iron - IR and FT-IR spectroscopy – principles and instrumentation (block diagram only) - Thermoanalytical methods – principles and applications of Thermogravimetry (TGA), Differential thermal analysis (DTA) and Differential Scanning Calorimetry (DSC).

UNIT – IV Organic Compounds for Textile Industry **9**

Cellulose – structure of cellulose – derivatives of cellulose – carboxy methyl cellulose and Gun cotton – structural aspects of cellulose –waxes - classification of waxes - Organic dyes – introduction – colour and chemical constitution – classification of dyes by structure – examples only– classification of dyes by methods of application – direct dyes – vat dyes – mordant dyes - azoic dyes – disperse dyes – reactive dyes – examples only - chemistry of reactive dyes – toxic dyes in wet processing.

UNIT – V Inorganic Compounds for Textile Industry **9**

Zeolites – types – applications – ion exchange properties of pigments – white pigments-titanium dioxide – lithophone – zinc oxide – coloured pigments - iron oxide – ultramarine – bleaching agents – Oxidising bleaching agents, calcium hypochlorite, hydrogen peroxide, Reducing bleaching agents- sulphur dioxide and sodium hyposulphite, Applications of Chemistry in textile technology.

TOTAL: 45 hours

Text Books

1. K. Karunakaran et al., "Chemistry For Textile Technology" by Sonaversity, Sona College of Technology, Salem, New Edition 2016.
2. P.C.Jain and Monica Jain, "Engineering Chemistry" Dhanpat Rai Pub, Co., New Delhi , 2010.

Reference Books

1. Gowariker V.R. , Viswanathan N.V. and JayadevSreedhar, "Polymer Science", New Age International P (Ltd.,), Chennai, 2006
2. B. Sivasankar, "Engineering Chemistry", Tata McGraw-Hill Pub. Co. Ltd., New Delhi (2008).
3. Gurdeep R. Chatwal, "Synthetic Organic Chemistry", Himalaya Publishing House, Mumbai, 1994.
4. Dr. C.V. Koushik and Antao Irwin Josico, "Chemical Processing of Textiles – Preparatory Processes and Dyeing", NCUTE Publication, New Delhi – 110 016.
5. ARUN BAHL and BAHL,"A Text Book of Organic Chemistry", S. CHAND & Company Ltd., New Delhi, 2003.
6. B.K. Sharma, "Industrial Chemistry", Krishna Prakasan Media (P) Ltd., Meerut.

PROBLEM SOLVING IN C (U15CPR206)

(Non Circuit branches: Mech, FT, Civil)

L	T	P	C	M
3	0	0	3	100

OBJECTIVES

To enable students to,

- Write C programs to solve problems using appropriate language features
- Implement problems with files
- Write programs applying concept of dynamic memory allocation
- Write programs with preprocessor directives
- Write programs using C Graphics features
- Write programs for sorting list of items and searching an item in a given list

UNIT I C PROGRAMMING FUNDMENTALS – A REVIES 9

Conditional statements – Control statements – Functions – Arrays – Pointers – Variation in pointer declarations – Function Pointers – Function with Variable number of arguments

UNIT II FILE HANDLING 9

Structures and Unions – File handling concepts – File read – write – binary and Stdio – File Manipulations. Command line arguments

UNIT III PREPROCESSOR AND DYNAMIC MEMORY ALLOCATION 9

Preprocessor : Macro Substitution, File Inclusion, Complier control Directives – Dynamic Memory Allocation : Library Functions for Dynamic Memory Allocation.

UNIT IV C GRAPHICS BASICS 10

Graphics programming, initializing the graphics, C Graphical functions, programs, Simple 2D graphics: Text, Lines, Arc, Ellipse, Polygon, Rectangle.

UNIT V SORTING AND SEARCHING TECHNIQUES **8**

Sorting algorithms: Insertion sort – Selection sort – Bubble sort – Merge sort –Quick Sort – Shell sort – Bucket sort – Searching: Linear and Binary Search.

TOTAL: 45 hours

Text Books

1. K R Venugopal, S R Prasad “Mastering C” Tata McGraw-Hill Education Pvt Ltd 2012

Reference Books

1. Brain W. Kernighan and Dennis M. Ritchie, “The C Programming Language” , 2nd Edition, Personal Education, 1988.
2. E Balagurusamy “Programming in ANSI C” Sixth Edition Tata McGraw-Hill Education Pvt Ltd, 2012
3. Mark Allen Weiss, “ Data Structures and Algorithm Analysis in C”. 2nd Edition, Person Education, 1997
4. Byron S Gottfried, “Programming with C”, Schaum”s Outlines, Second Edition, Tata McGraw-Hill, 2006.
5. Yashavant P. Kanetkar. “Let Us C”, BPB Publications, 2013, _ Ed 13 the Edition
6. Deitel and Deitel, “C How to Program”, Person Education, New Delhi, 2011.

INTRODUCTION TO DATA STRUCTURES IN C (U15CPR206)
(Non Circuit branches: CSE, FT, EEE, ECE)

L	T	P	C	M
3	0	0	3	100

OBJECTIVES

To enable students to,

1. Write C programs to solve problems using appropriate language features
2. Implement problems with files
3. Implement abstract data types for linear data structures – list, stack and queues.
4. Apply the linear data structures for solving problems'
5. Write programs for sorting list of items and searching an item in a given list

UNIT I C PROGRAMMING FUNDAMENTALS – A REVIEW 9

Conditional statements – Control statements – Functions – Arrays – Preprocessor – Pointers – Variation in pointer declarations – Function Pointers – Function with Variable number of arguments.

UNIT II FILE HANDLING 9

Structures and Unions – File handling concepts – File read – write – binary and stdio –File Manipulations. Command line arguments.

UNIT III LINEAR DATA STRUCTURES – LIST 9

Abstract Data Types (ADTs) - List ADT – array – based implementation – linked list implementation – singly linked lists – circularly linked lists – doubly – linked lists – applications of lists – polynomial Manipulation – All operations (Insertion, Deletion, Merge, Traversal)

UNIT IV LINEAR DATA STRUCTURES – STACKS, QUEUES 10

Stack ADT – implementation – applications – Queue ADT – circular queue implementation - Double ended Queues – applications of queues.

UNIT V SORTING AND SEARCHING TECHNIQUES 8

Sorting algorithms: Insertion sort – Selection sort – Bubble sort – Merge sort – Quick Sort – Shell sort – Bucket sort – Searching: Linear Search and Binary Search.

TOTAL: 45 hours

Text Books

1. Brain W. Kernighan and Dennis M. Ritchie, "The C Programming Language", 2nd Edition, Person Education, 1988.
2. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2nd Edition, Pearson Education, 1977.

Reference Books

1. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Cliffort Stein, " Introduction to Algorithms", Second Edition, Megraw Hill, 2002.
2. Reema Thareja, "Data Structures Using C", Oxford University Press, 2011.
3. Aho, Hopcroft and Ullman, "Data Structures and Algorithms", Pearson Education, 1983.
4. Byron S Gottfried, "Programming with C", Schaum"s Outlines, Second Edition. Tata McGraw-Hill, 2006.
5. Yashavant P. Kanetkar. "Let Us C", BpB Publicatons, 2013, Ed 13 th Edition.
6. Deitel and Deitel, "C How to Program", Pearson Education, New Delhi, 2011.

ENGINEERING GRAPHICS (U14EG106 & U14EGR207)

L	T	P	C	M
2	0	3	4	100

OBJECTIVES

To develop in student's graphic skill for communication of concepts, ideas and design of engineering products and expose them to existing national standards related to technical drawings.

Concepts and conventions (Not for Examination) 2

Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

Computer Aided Drafting (Not for Examination) 6

Importance 2d Drafting – sketching, modifying, transforming and dimensioning

UNIT I PLANE CURVES (Free hand sketching) 10

Curves used in engineering practices

Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the above curves.

UNIT II ISOMETRIC TO ORTHOGRAPHIC VIEWS (Free hand sketching) 10

Representation of three dimensional objects – General Principles of Orthographic projection – Need for importance of multiple views and their placement – First angle projection – layout of views – Developing visualization skills through free hand sketching of multiple views from pictorial views of objects.

UNIT III PROJECTION OF POINTS, LINES AND PLANE SURFACES (Free hand sketching and 2D Software) 10

Projection of points – Projection of straight lines located in the first quadrant – Determination of true lengths and true inclinations – Projection of polygonal surface and circular lamina inclined to one reference planes.

UNIT IV PROJECTION OF SOLIDS (Free hand sketching and 2D Software) 12

Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.

UNIT V SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES (Free hand sketching and 2D Software) 10

Sectioning of simple solids like prisms, pyramids, cylinder and cone in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other – (Obtaining true shape of section is not required).

Development of lateral surfaces of simple and truncated solids – Prisms, pyramids, cylinders and cones.

TOTAL: 60 hours

Text Books

1. Engineering Graphics and Drawing (5th Edition) by Sonaversity, Sona College of Technology, Salem.
2. Modeling software packages like solid edge, unigraphics and Auto CAD

Reference Books

1. Dhananjay A.Jolhe, "Engineering Drawing with an introduction to AutoCAD" Tata McGraw Hill Publishing Company Limited (2008).
2. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi, (2008).
3. K. R. Gopalakrishnana, "Engineering Drawing" (Vol. I & II), Subhas Publications (1998).
4. K. V. Natrajan, "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai (2006).

ELECTRIC CIRCUIT THEORY (U15ECT207)

L	T	P	C	M
3	1	0	4	100

OBJECTIVES

To enable students,

1. To familiarize the basic laws, theorems of electrical circuits
2. To impart the basic knowledge on methods of network analysis
3. To introduce the concept of network theorems
4. To make the students knowlwedge in single and three phase circuits
5. To impart the fundamentals of AC circuits and concept of resonance

UNIT I DC Fundamentals 12

Electrical Components – Resistance, Conductance – factors affecting resistance – effect of temperature on reistance, Ohm's Law and its limitations, Kirchhoff's' Laws (statement only), series – parallel resistive circuits, comparison of series and parallel circuits, Star - Delta Transformation – Problems.

UNIT II Analysis of Electric Circuits 12

Network Reduction: Voltage and Current Division, Source Transformation –Mesh current and Nodal Voltage Method of Analysis for D.C Circuits – Problems.

UNIT III Network Theorems for D.C. Circuits 12

Thevenin and Norton Theorem – Superposition Theorem – Maximum Power Transfer Theorem – Reciprocity Theorem – Problems.

UNIT IV AC Fundamentals **12**

AC Waveforms - Standard Terminologies – Inductor, Capacitor. Sinusoidal, Triangular and Square wave forms, Effective value or RMS Value – Average value – Form Factor, Peak Factor, Single Phase AC Circuits – RL, RC, RLC series and parallel circuits – Resonance , Power, Power factor, Impedance series and parallel circuits - Problems.

UNIT V Analysis of Three Phase Circuits **12**

Three Phase 3 – wire and 4 – wire circuits with Star and Delta Connected loads, Balanced & Unbalanced – Phasor diagram of Voltages and Currents – Power and Power factor measurements in Three Phase Circuits -Problems

TOTAL: 60 hours

Text Books

1. William HB. Hayt Jr, Jack E. Kemmerly and Steven M. Durbin, "Engineering circuits Analysis", TMH publishers, 6th edition, New Delhi, (2002).
2. Sudhakar A and Shyam Mohan SP, Circuits and Network Analysis and Synthesis", Tata Mc Graw Hill, (2007).

Reference Books

1. Paranjothi SR, "Electric Circuits Analysis", New Age International Ltd., New Delhi, (1996).
2. Joseph A. Edminister, Mahmood Nahri, "Electric circuits", Schaum's Series, Tata Mc Graw – Hill, New Delhi (2001).
3. Chakrabarti A, "Circuits Theory (Analysis and synthesis), Dhanpath Rai & Sons, New Delhi, (1999).
4. Charles K. Alexander, Mathew N.O. Sadik, "Fundamentals of Electric Circuits" 2002

ENGINEERING MECHANICS (U14EME207)

L	T	P	C	M
3	1	0	4	100

OBJECTIVE

At the end of this course the student should be able to understand the vectorial and scalar representation of forces and moments, static equilibrium of particles and rigid bodies both in two dimensions and also in three dimensions. Further, he should understand the principle of work and energy. He should be able to comprehend the effect of friction on equilibrium. He should be able to understand the laws of motion, the kinematics of motion and the interrelationship. He should also be able to write the dynamic equilibrium equation. All these should be achieved both conceptually and through solved examples.

UNIT I BASICS & STATICS OF PARTICLES 12

Introduction – Units and Dimensions – Laws of Mechanics – Lame's theorem, Parallelogram and triangular Law of forces – Vectors – Vectorial representation of forces and moments – Coplanar Forces – Resolution and Composition of forces – Equilibrium of a particle

Forces in space – Equilibrium of a particle in space – Equivalent systems of forces – Principle of transmissibility – Single equivalent force.

UNIT II EQUILIBRIUM OF RIGID BODIES IN 2 DIMENSIONS 12

Free body diagram – Types of supports and their reactions – requirements of stable equilibrium – Moments and Couples – Moment of a force about a point – Varignon's theorem – Equilibrium of Rigid bodies in two dimensions

UNIT III FRICTION 12

Frictional force – Laws of Coulomb friction – Angle of friction – cone of friction – Equilibrium of bodies on inclined plane – Ladder friction - Wedge Friction – Belt friction – Screw Jack - Self locking

UNIT IV PROPERTIES OF SURFACES AND SOLIDS 12

Determination of Areas and Volumes – First moment of area and the Centroid of sections – Rectangle, circle, triangle from integration – T section, I section, Hollow section by using standard formula

Second and product moments of plane area – Rectangle, triangle, circle from integration – T section, I section by using standard formula – Parallel axis theorem and perpendicular axis theorem – Polar moment of inertia – Principal moments of inertia of plane areas – Principal axes of inertia – Mass moment of inertia of cylinder

UNIT V DYNAMICS OF PARTICLES **12**

Displacements, Velocity and acceleration, their relationship – Rectilinear and Curvilinear motion – Newton's law – Work Energy Equation of particles – Impulse and Momentum – Impact of elastic bodies.

TOTAL: 60 hours

Text Book

1. Beer, F.P and Johnson Jr. E.R. "Vector Mechanics for Engineers", Vol. 1 Statics and Vol. Dynamics, McGraw–Hill International Edition, (1997).

References

1. Rajasekaran, S, Sankarasubramanian, G., "Fundamentals of Engineering Mechanics", Vikas Publishing House Pvt. Ltd., (2000).
2. Hibbeller, R.C., "Engineering Mechanics", Vol. 1 Statics, Vol. 2 Dynamics, Pearson Education Asia Pvt. Ltd., (2000).
3. Palanichamy, M.S., Nagam, S., "Engineering Mechanics – Statics & Dynamics", Tata McGraw–Hill, (2001).
4. MeriamJ.L,KraigeL.G,"Engineering Mechanics-Statics"6th Edition, Wiley, 2010.
5. Irving H. Shames, "Engineering Mechanics – Statics and Dynamics", IV Edition – Pearson Education Asia Pvt. Ltd., (2003).
6. Ashok Gupta, "Interactive Engineering Mechanics – Statics – A Virtual Tutor (CDROM)", Pearson Education Asia Pvt., Ltd., (2002).

FIBRE SCIENCE AND TECHNOLOGY (U15FTY207)

L	T	P	C	M
3	0	0	3	100

OBJECTIVE

To enable students,

1. Classify textile fibres, define fundamental textile terms and briefly explain concepts related to fibre structure and properties.
2. Explain the production of major natural fibres and state their properties and uses.
3. Describe the common man-made spinning techniques and explain the production, properties and uses of major natural-polymer fibres.
4. Outline the production sequence, properties and uses of typical synthetic and specialty fibres.
5. Describe the identification methods of common fibres and explain the common linear density systems for man-made fibres.

UNIT -I GENERAL INTRODUCTION 9

Definitions: Fibre: Textile fibre, Staple fibre, Filament; Yarn: Spun, Continuous filament, Monofilament and Multifilament, Flat and Textured yarn; Single, Ply and Cabled yarns; Thread; fabric: Woven, Knitted and Non-woven fabrics.

Classification of textile fibres: Main classes and sub-classes with examples for each class / sub-class.

Basic concepts of fibre structure: Definition of orientation, Schematic representations of fibre structure and Properties of poorly-oriented, Moderately-oriented and highly-oriented fibres; definition of crystallinity, Schematic representation of fibre with crystalline and amorphous contents, crystallinity of some common natural and man-made fibres.

Properties Expected of a Textile Fibre: Definitions of fibre length, Fineness, Strength, Flexibility, Elongation, Elasticity, Moisture content and Moisture regain, Crimp, Fibre uniformity, Lustre, Fibre modulus, Tm and Tg; Essential and desirable properties of a textile fibre; Examples of typical physical, chemical, biological and thermal attributes of textile fibres

Moisture terms: Definitions of absolute humidity, Relative humidity; Standard moisture regain of common fibres.

UNIT II NATURAL FIBRES **9**

Cellulosic fibres

Cotton: Introduction, Properties and uses; Brief study of organic cotton, BT cotton and naturally coloured cotton.

Flax: Introduction, Properties and uses.

Protein fibres

Silk: Types; Production processes: reeling, throwing, degumming, weighting; silk mark; Properties and uses.

Wool: Classification of wool, grading of wool, production processes, wool mark, Properties and uses.

UNIT III MAN MADE REGENERATED FIBRES **9**

Introduction to man-made fibre spinning

Production sequence, properties and uses of natural-polymer fibres: Viscose rayon, Modal, Lyocell, Acetate.

UNIT IV SYNTHETIC FIBRES **9**

Production sequence, properties and uses of synthetic-polymer fibres: Polyester, Nylon, Acrylic, Polypropylene and Elastomeric fibre; Speciality fibres: Nomex and Kevlar.

UNIT V LINEAR DENSITY AND IDENTIFICATION OF FIBRES **9**

Linear density: Definition, Denier and Tex systems, Decitex, Millitex, Kilotex and English cotton count; Conversion formulae and simple calculations of linear density.

Microfibres: Definition, Advantages and Uses.

Identification of textile fibres: Microscopic test, burning test, solubility test and density test.

TOTAL: 60 hours

Text Book

1. Srinivasamoorthy H. V., “Introduction to Textile Fibres”, The Textile Association India, Mumbai, 1993
2. Mishra S.P., “Fibre Science and Technology”, New Age International Publishers, New Delhi, 2000

References

1. Bernard P. Corbman, “Textiles: Fibre to Fabric”, McGraw Hill International Edition, New Delhi, 1983
2. Mukhopadhyay S.K., “Advances in Fibre Science”, The Textile Institute, UK, 1992
3. Cook, J. Gordon, “Hand Book of Textile Fibres: Man-Made Fibres”, Vol. 1 and 2, Merrow Publishing Co. Ltd., England, 2005
4. Moncrief R.W., “Manmade Fibres”, John Willey & Sons, New York, 2000

PHYSICS AND CHEMISTRY LABORATORY II (U15PCL208)

PHYSICS PART

L	T	P	C	M
0	0	3	2	50

(Common to all branches)

List of Experiments

1. Torsion Pendulum – Determination of rigidity modulus.
2. Hysteresis – B-H curve.
3. Carey Foster's bridge – Determination of specific resistance of a given wire.
4. Uniform bending apparatus – Determination of Young's modulus.
5. Spectrometer – Determination of wavelength of mercury spectrum.
6. Band gap apparatus – Determination of band gap of a semiconductor diode.

(ANY FIVE EXPERIMENTS)

PHYSICS AND CHEMISTRY LABORATORY I (U15PCL107)

CHEMISTRY PART

L	T	P	C	M
0	0	2	1	50

(Common to all branches)

List of Experiments

1. Estimation of hardness of Water by EDTA method.
2. Estimation of alkalinity of Water sample by indicator method.
3. Estimation of hydrochloric acid by pH metry.
4. Conductometric titration of strong acid vs strong base (HCl vs NaOH).
5. Estimation of ferrous iron by potentiometry.
6. Determination of corrosion rate by weight loss measurements.

(ANY FIVE EXPERIMENTS)

ELECTRIC CIRCUITS LABORATORY (U15ECL210)

L	T	P	C	M
0	0	3	2	100

OBJECTIVE

To enable students,

1. To design and analysis the RLC series and parallel resonance circuits
2. To analysis the circuits using various network theorems
3. To study the various simulation tools used in electrical and electronics engineering

List of Experiments

1. Verification of Ohm's Law and Kirchhoff's Law
2. Measurement of Power and Power Factor for RLC Series circuit.
3. Measurement of Power and Power Factor for RLC Parallel circuit.
4. Frequency response of RLC Series Resonance circuits.
5. Frequency Response of RLC Parallel Resonance circuits.
6. Measurement of Power and Power Factor using Two Wattmeter Method.
7. Verification of Mesh and Nodal Analysis.
8. Verification of Superposition Theorem.
9. Verification of Thevenin's Theorem.
10. Verification of Norton Theorem.
11. Verification of Maximum Power Transfer Theorem.
12. Verification of Reciprocity Theorem.
13. Study of simulation tools to solve basic electric circuits

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY (U15BEEL210)

L	T	P	C	M
0	0	3	2	100

List of Experiments

1. Verification of Kirchhoff's Law.
2. Measurement of Power and Power Factor for series RLC circuit.
3. Measurement of Power and Power Factor for Parallel RLC circuit.
4. Frequency response of RLC Series Resonance circuit.
5. Frequency Response of RLC Parallel Resonance circuit.
6. VI Characteristics of PN Junction Diode.
7. VI Characteristics of Zener Diode.
8. Measurement of ripple factor for Half wave and Full wave rectifier.
9. Verification of Demorgan's Theorem and Consensus theorem using logic gates
10. Implementation of Logic function using logic gates.
11. Study of three phase AC circuits

COMPUTER AIDED DRAFTING LABORATORY (U14CDL210)

L	T	P	C	M
0	0	3	2	100

List of Experiments

1. General Introduction

Introduction to CAD Modeling Software – Industrial Applications – Parametric & Feature based modeling. Comparison - CAD models with Proto types. Practice - Sketch – Part Model – Detailing.

Introduction about ANALYSIS.

2. Preparation of Standard Solid Primitives

Create 3D- simple solids- Prism, Pyramid, Cylinder and Cone – Front view-Top view- and side view Create 3D simple models- V-block, Spur Gear, Bolt and Nut etc.).

3. Preparation of Orthographic Drawing and Sectioning

Ortho graphic view and Cut section of standard Machine Elements.,

4. Material Properties and Rendering

Applying different materials for Machine Components-Steel –Aluminum-Copper-Brass-Silver-Wood-Plastic-Ceramic-.Concrete etc., Preparing Final CAD outputs with rendering features.

5. Geometric Tolerance and Dimension

Detailing with Fits, Limits and Tolerance.

Introduction to GD&T – Industrial Drawing practice- Machining symbols, Welding Symbols etc.,

Note: Laboratory Practicing CAD Modeling Software: Solidworks 2012.

FIBRE ANALYTICAL LABORATORY (U15FTL210)

L	T	P	C	M
0	0	3	2	100

OBJECTIVE

To enable students,

1. Identify the common textile fibres and determine the blend proportions of binary blends.
2. Determine the physical properties, like fibre length, fineness, moisture regain, density of given fibres.
3. Examine and discuss the swelling behaviour of cotton and viscose rayon fibres in water and alkaline solution.
4. Estimate the spin finish content in synthetic fibres or wax content in cotton.

List of Experiments

1. Identification of fibres by microscopy: longitudinal view of fibres
2. Identification of fibres by microscopy: cross-sectional view of fibres
3. Confirmation of fibres by means of the burning test
4. Confirmation of fibres by means of the solubility test
5. Identification of a textile fibre of unknown identity using microscopic, burning and solubility tests
6. Determination of blend proportion in fibre mixtures
7. Determination of blend proportion in blended yarn / fabric
8. Examination of the diametric swelling behaviour of cotton and viscose rayon fibres in water and alkali solution
9. Determination of the atmospheric conditions in the lab and the amount of moisture in given samples of conditioned and unconditioned fibre
10. Estimation of the crimp of man-made staple fibre and the denier by length and mass measurements

DEMONSTRATION EXPERIMENTS

1. Estimation of spin-finish content in man-made fibre or wax content in cotton by using Soxhlet extraction
2. Floatation principle to identify textile fibres by their density

TOTAL: 45 hours

List of equipment required for a batch of 30- students for U.G

S. No.	Name of the equipment / software	Quantity Required
1.	Simple and Projection Microscope	3
2.	Electronic Balance (1 mg. accuracy)	1
3.	Hot-Air Oven	1
4.	Soxhlet Apparatus	2
	Total	**7**