

**KUMARAGURU COLLEGE OF TECHNOLOGY,  
COIMBATORE – 641 049**  
(An Autonomous Institution Affiliated to Anna University, Chennai)

**REGULATIONS - 2014**  
**CURRICULUM AND SYLLABI FOR I & II**  
**SEMESTERS**

**KUMARAGURU COLLEGE OF TECHNOLOGY, COIMBATORE - 641049**  
**(An Autonomous Institution Affiliated to Anna University, Chennai)**

**SEMESTER – I**  
**(COMMON TO ALL BRANCHES OF ENGINEERING & TECHNOLOGY)**

| Code No.                | Course Title                                | L | T | P | C |
|-------------------------|---|---|---|---|---|
| <b>THEORY</b>           |   |   |   |   |   |
| U14ENT101               | Functional English-I                        | 2 | 0 | 2 | 3 |
| U14MAT101               | Engineering Mathematics – I                 | 3 | 1 | 0 | 4 |
| U14PH7101               | Engineering Physics                         | 3 | 0 | 0 | 3 |
| U14CH7101               | Engineering Chemistry                       | 3 | 0 | 0 | 3 |
| U14MET101               | Engineering Graphics                        | 2 | 0 | 3 | 3 |
| U14CST101               | Structured Programming using ‘C’            | 3 | 1 | 0 | 4 |
| <b>PRACTICAL</b>        |   |   |   |   |   |
| U14PHP101/<br>U14CHP101 | Physics Laboratory / Chemistry laboratory*  | 0 | 0 | 3 | 1 |
| U14MEP101               | Engineering Practices Laboratory            | 0 | 0 | 3 | 1 |
| U14CSP101               | Structured Programming Laboratory using ‘C’ | 0 | 0 | 3 | 1 |
| U14GHP101               | Human Excellence - Personal Values-I        | 1 | 0 | 1 | 1 |

**TOTAL – 34 HOURS**

**TOTAL CREDITS – 24**

\*Physics Lab is offered for 50% of the classes and Chemistry lab for remaining 50% of the classes in the first semester. In the second semester the labs are interchanged.

| <b>SEMESTER</b> | <b>AE, CE, CSE, IT, ME, MCE</b>                 | <b>AU, BIO, EEE, ECE, EIE, FT, TXT</b> |
|-----------------|---|--|
| First semester  | U14PHP101- PHYSICS LAB                          | U14CHP101 - CHEMISTRY LAB              |
| Second semester | U14CHP201- CHEMISTRY LAB<br>(Except CSE Branch) | U14PHP 201 - PHYSICS LAB               |

|   |          |          |          |          |
|---|----------|----------|----------|----------|
| <b>U14ENT101/ FUNCTIONAL ENGLISH</b>                          | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
| <b>(Common to all branches of Engineering and Technology)</b> | <b>2</b> | <b>0</b> | <b>2</b> | <b>3</b> |

## **OBJECTIVES**

- Discover an understanding of the process of oral communication
- Originate knowledgeable audience-centered speaking
- Formulate a significant training ground for the development of student's abilities in public speaking
- Create multiple opportunities for students to practice and share their reading skill development
- Improve critical thinking and analytical skills
- Develop a milestone for leadership and group participation through communication skills

## **READING: FUNDAMENTALS OF ENGLISH**

**15 Hours**

Fundamentals of English Grammar - Basics of sentence completion - Syntax- Giving facts and explaining functions and processes - Explaining concepts and ideas - Giving encouragement: phrases for positive feedback; more emphatic adjectives and adverbs - Giving, getting and checking information - Signaling the structure of a presentation – introducing, sequencing and concluding a talk - Reading a report - New technologies and change - News Paper Reading.

## **WRITING: BASIC STRATEGIES OF WRITING**

**15 Hours**

Agreeing and disagreeing – Practice of frequency - Article Writing (Critical writing- Creative writing)- Anecdote Formation - Greeting friends and strangers - Short prepared compositions on current affairs - Writing a proposal for conducting science exhibition - Factual business letters and E-mail etiquette

## **LISTENING: LANGUAGE ACQUISITION**

**15 Hours**

Descriptive words and regular - irregular verbs - Conversation between old friends; introducing others - Tense and voice - Establishing relationships and negotiating - Discussion on Practical business tasks- Ordering or answering enquiries - Short telephone conversations - Outline a problem and present a solution - Fluency Drills- British and American equivalents..

## **SPEAKING: ADEPTNESS OF ARTICULATION**

**15 Hours**

Practice of phonetic transcription (Vowel and Consonant symbols) - Presenting information - General business discussions and factual discussions -Giving and getting product information - Describing organizations - Practicing of conversation starters and closers with friends and strangers - Asking about possibility/preference - Offering help - Seeking permission – Persuading - Talking about people and places - Explaining ideas and visual information

**TOTAL: 60 HOURS**

**REFERENCES**

1. Mark Ibbotson, Cambridge English for Engineering, Cambridge University Press,. 2008.
2. Barbara H. Foley, Elizabeth R. Neblett, English in Action, Adult &Academic ESL, .2003.
3. Jeremy Comfort, Pamela Rogerson, Trish Stott and Derek Utley, Speaking Effectively, Cambridge University Press, .1994
4. Dorothy Adams, Everyday English: A Course on Communicative English, Cengage learning, 2009
5. Guy Brook – Hart, BEC Vantage- Business Benchmark Upper – Intermediate, 2006

**COURSE OUTCOMES**

- Formulate and practice effective reading strategy to enhance technical communication
- Assess strengths in writing skills and set goals for future growth
- Practice and perceive the full repertoire of listening strategies by using authentic listening tasks
- Create learning situations to develop speaking skills based on sound educational and communication theories.

|   |          |          |          |          |
|---|----------|----------|----------|----------|
| <b>U14MAT101/ ENGINEERING MATHEMATICS -I</b>                  | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
| <b>(Common to all branches of Engineering and Technology)</b> | <b>3</b> | <b>1</b> | <b>0</b> | <b>4</b> |

## **OBJECTIVES**

**On completion of the course, the students are expected**

- To know eigen values and eigen vectors and diagonalization of a matrix.
- To know about the geometrical aspects of curvature, evolute and envelope.
- To understand the concepts of partial differentiation, maxima and minima.
- To solve ordinary differential equations of first and higher order of certain types and its applications.

## **MATRICES**

**9 Hours**

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

## **GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS**

**9 Hours**

Curvature – Radius, Centre and Circle of curvature in Cartesian, Parametric and Polar form – Evolute – Envelope of family of curves with one and two parameters – Evolute as the envelope of normals.

## **FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS**

**9 Hours**

Leibnitz's equation – Bernoulli's equation – Equations of first order and higher degree - Clairaut's form – Applications: Orthogonal trajectories and simple Electric circuit problems. (Differential equation and associated conditions need to be given).

## **HIGHER ORDER LINEAR DIFFERENTIAL EQUATION**

**9 Hours**

Linear equations of second and higher order with constant coefficients – Euler's and Legendre's linear equations – Method of variation of parameters – First order Simultaneous linear equations with constant coefficients - Application - oscillatory electrical circuit. (Differential equation and associated conditions need to be given).

## **FUNCTIONS OF SEVERAL VARIABLES**

**9 Hours**

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

**L: 45 Hr, T: 15 Hr, TOTAL: 60 HOURS**

## REFERENCES

1. Veerarajan T., Engineering Mathematics (for First Year), Tata McGraw Hill Pub. Co. Ltd., New Delhi, Revised Edition, 2007.
2. Kandasamy P., Thilagavathy K. and Gunavathy K., Engineering Mathematics, S. Chand & Co., New Delhi, 2008.
3. Kreyzig E., Advanced Engineering Mathematics, Eighth Edition, John Wiley & sons, 2010.
4. Arunachalam T., Engineering Mathematics I, Sri Vignesh Publications, Coimbatore. (Revised) 2009.
5. Venkataraman M.K., Engineering Mathematics, The National Pub. Co., Chennai, 2003.
6. Ramana B.V, Higher Engineering Mathematics, Tata McGraw Hill Publishing Company, New Delhi, 2007.
7. Grewal B.S., “Higher Engineering Mathematics”, Khanna Publishers, New Delhi, 40<sup>th</sup> Edition. .

## COURSE OUTCOMES

- Know eigen values and eigen vectors and its role in the system of equations
- Discover the radius, centre and circle of curvature of any curves
- Solve the ordinary differential equations of certain types and its applications.
- Identify the maximum and minimum values of surfaces.

|   |          |          |          |          |
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| <b>U14PH7101/ ENGINEERING PHYSICS</b>                         | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
| <b>(Common to all branches of Engineering and Technology)</b> | <b>3</b> | <b>0</b> | <b>0</b> | <b>3</b> |

## OBJECTIVES

At the end of the course the students would be exposed to fundamental knowledge in

- Various engineering subjects and applications.
- Structure identification of engineering materials.
- Non-destructive techniques.
- Interferometric techniques in metrology and electrical phenomena.
- Application of lasers in engineering and technology.
- Atomic and Nuclear related theories.

## CRYSTAL PHYSICS

**9 Hours**

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

## APPLIED OPTICS

**9 Hours**

Interference – airwedge and its applications – Michelsons interferometer – construction, working – determination of wave length and thickness – Lasers – spontaneous and stimulated emissions – Einsteins coefficients – Nd: YAG, Co<sub>2</sub> and semiconductor laser – Homojunction and Hetrojunction (only qualitative description) – applications – CD-ROM and holography (qualitative only) – optical fibre – principle and propagation of light in optcal fibers – Numerical aperture and acceptance angle – types of optical fibres – applications – fibre optic communication system – medical endoscopy.

## QUANTUM PHYSICS

**9 Hours**

Plancks quantum theory of black body radiation (derivation) – Photo electric effect – Compton effect (derivation) and experimental verification of Compton effect – De-broglies concept - Schrodinger wave equation – time independent and time dependent equations (derivations) – physical significance of wave function – particle in a box ( one dimensional case) – Electron microscope – Scanning electron microscope – Transmission electron microscope.

## ULTRASONICS AND NDT

**9 Hours**

Introduction – production – magnetostriction effect – magnetostriction generator – piezoelectric effect – piezo electric generator –properties –detection – cavitation –acoustic grating – velocity measurement – applications –Sonar –velocity of blood flow – NDT –Liquid Penetrant method – Ultrasonic flaw detector – A scan, B scan, C scan – X- ray radiography and fluoroscopy – Thermography.

## **ATOMIC AND NUCLEAR PHYSICS**

**9 Hours**

Introduction – Atomic spectra – Molecular spectra – Applications – Raman effect – Stokes lines and anti stokes lines – Applications – Nuclear models – Liquid drop model – The Shell model- Nuclear fission – Theory – Energy released per fission – Chain reaction – Controlled chain reaction – Nuclear reactors – Condition for sustained chain reaction – Types of Nuclear reactors – Nuclear fusion – Thermo nuclear reactions – Differences between fission and fusion

**TOTAL: 45 HOURS**

## **REFERENCES**

1. Rajendran V, Applied Physics, Tata McGraw Hill Publishing Company Limited, New Delhi, 2003.
2. Gopal S., Engineering Physics, Inder Publications, Coimbatore, 2006.
3. Palinisamy P.K., Engineering Physics I, Scitech Publications, Chennai, 2011.
4. Avadhanulu M.N. and Kshirsagar P.G., A textbook of Engineering Physics, S.Chand & Company Ltd, New Delhi, 2005.
5. Gaur R.K. and Gupta S.L., Engineering Physics, 8<sup>th</sup> edition, Dhanpat Rai Publications (P) Ltd., New Delhi, 2003.

## **COURSE OUTCOMES**

- Analyze and identify the crystal structure in materials
- Categorize and illustrate the optical materials and its application to engineering
- Examine and compare samples at nano level
- Apply the NDT techniques and modern engineering tools necessary for engineering practice.
- Discuss the role of nuclear physics in energy production



|   |          |          |          |          |
|---|----------|----------|----------|----------|
| <b>U14CH7101/ ENGINEERING CHEMISTRY</b>                       | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
| <b>(Common to all branches of Engineering and Technology)</b> | <b>3</b> | <b>0</b> | <b>0</b> | <b>3</b> |

## OBJECTIVES

- To inculcate an understanding of the importance of chemistry by providing an overall perspective of theoretical and modern technological aspects of applied chemistry before beginning their more specialized courses.
- To embellish the usage of chemistry to exhibit engineering and technical concepts

## ELECTROCHEMISTRY

**9 Hours**

Introduction - Electrode potential – Nernst equation and problems - Electrochemical series - Application of EMF measurements & problems - Kohlrausch law of independent migration of ions & its application - Conductometric titrations (acid - base & precipitation titration)

**Electrodes** : Standard and reference electrode (Hydrogen & Calomel) – Types of electrodes (Metal – Metal ion; Metal – Metal insoluble salt, Redox electrode) - Ion selective (glass electrode) – determination of pH using glass electrode

**Cells** : Galvanic cell – Types of concentration cells

## ENERGY STORING DEVICES

**9 Hours**

**Batteries** : Primary Battery (Leclanche & Alkaline battery) - Secondary Battery (Lead acid storage battery, Nickel - Cadmium battery & Lithium – Polymer battery) – Flow battery (Hydrogen and Oxygen Fuel Cell)

**Solar Cells**: Hybrid Solar cells

## THERMODYNAMICS

**9 Hours**

Introduction - Thermodynamic process (isothermic, isobaric, isochoric and adiabatic processes) - Internal energy – first law of thermodynamics (Mathematical derivation & limitation) - Enthalpy - Second law of thermodynamics - Entropy - Entropy change of an ideal gas & problems - Free energy - work function - Gibbs Helmholtz equation (derivation, applications & problems) - Van't Hoff isotherm (derivation & problems) - Van't Hoff isochore - (derivation & problems) - Third law and zeroeth law (Only statements)

## SURFACE CHEMISTRY

**9 Hours**

Introduction of adsorption - Types of Adsorption - Adsorption isotherm (Freundlich isotherm, Langmuir adsorption isotherm, BET isotherm) - Applications of adsorption : Role of adsorption in catalytic reactions, Ion exchange adsorption, adsorption chromatography (Column chromatography)

## **SPECTROSCOPY**

**9 Hours**

Introduction to spectroscopy - Beer Lambert's Law - Colorimetric analysis (principle, instrumentation (block diagram only) & application (Estimation of concentration of Ferrous and copper ions a solution by colorimetry) - UV – visible spectroscopy (principles, instrumentation (block diagram only) & simple Applications) - IR spectroscopy (principles, instrumentation (block diagram only) & simple applications) - Flame photometry (Principle, instrumentation (block diagram only) & simple Applications)

**TOTAL: 45 HOURS**

## **REFERENCE**

1. Bahl B.S.,Tuli G.D. and ArunBahl., Essential of Physical Chemistry, S.Chand& Co. Ltd., New Delhi.
2. Somorjai G.A., Introduction to surface chemistry and Catalysis, John Wiley & Sons Inc., New York.
3. Shaw D.J., Introduction to colloidal and surface Chemistry, Butterworth – Heinemann Publishers
4. Syed Shabudeen, P.S. and Shoba U.S., Engineering Chemistry, Inder Publishers, Coimbatore.
5. Jain P.C. and Monika Jain, Engineering chemistry, Dhanpatrai Pub. Co. (P) Ltd., New Delhi.
6. Puri B.R., Sharma L.R. and Pathania M.S., Principles of Physical chemistry, ShobanLal Nagin Chand & Co., New Delhi

## **COURSE OUTCOMES**

- Assemble a battery and illustrate the phenomenon of production of electric current
- Discuss the thermodynamic concepts and predict the feasibility of chemical reaction
- Apply the theory of adsorption in real life situations
- Outline the principles and instrumentation of spectroscopic techniques

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|---|----------|----------|----------|----------|
| <b>U14CST101/ STRUCTURED PROGRAMMING USING C</b>              | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
| <b>(Common to all branches of Engineering and Technology)</b> | <b>3</b> | <b>1</b> | <b>0</b> | <b>4</b> |

## OBJECTIVES

- To enable students to learn about the basics of computers and problem solving methods
- To learn the various features of C
- To learn how to program using C language

## INTRODUCTION

**9 Hours**

Programs and Programming- Programming languages and Their Classification - Compiler, Linker, Loader and Interpreter – Structured Programming Concept –Algorithm – Pseudo Code – Flow Chart.Number System – Binary – Decimal – Conversion Problems.

## C LANGUAGE BASICS

**9 Hours**

Introduction to C Programming –Fundamentals – Structure of a C Program – Compilation And Linking Processes – Constants, Variables – Data Types – Expressions Using Operators In C – Managing Input And Output Operations – Decision Making And Branching – Looping Statements – Solving Simple Scientific And Statistical Problems.

## ARRAYS AND STRINGS

**9 Hours**

Arrays – Initialization – Declaration – One Dimensional And Two Dimensional Arrays. String-String Operations – String Arrays. Simple Programs- Sorting- Searching – Matrix Operations.

## FUNCTIONS AND POINTERS

**9 Hours**

**Functions:** Definition of function – Declaration of function – Pass by value – Pass by reference – Recursion.

**Storage classes** – auto, static, extern, register- scope rules.

**Pointers:** Definition – Initialization – Pointers arithmetic – Pointers and arrays- Dynamic memory allocation - Example Problems

## STRUCTURES AND UNIONS AND FILES

**9 Hours**

**Structures and Unions:** Introduction – need for structure data type – structure definition – Structure declaration – Structure within a structure - Union - Programs using structures and Unions.

**Files:** Introduction – Using files in C- Working with text files.

**L: 45 Hr, T: 15 Hr, TOTAL: 60 Hours**

## **REFERENCES**

1. Rajasekaran S., Numerical methods in Science and Engineering-A practical approach, S. Chand and Company, New Delhi, 2012.
2. Kernighan B.W. and Ritchie D.M., The C Programming language, Second Edition, Pearson Education, 2006.
3. Byron S. Gottfried and Jitendar Kumar Chhabra, Programming with C, Tata McGraw Hill Publishing Company, Third Edition, New Delhi, 2011.
4. Ashok N. Kamthane, Computer programming, Pearson Education, 2007.
5. Pradip Dey and Manas Ghosh, Programming in C, Second Edition, Oxford University Press, 2011.

## **COURSE OUTCOMES**

- Explain the basics of programs and programming
- Select appropriate data types and control structures for solving a given problem.
- Illustrate the representation of arrays, strings and usage of string operations.
- Illustrate the importance of pointers and dynamic memory allocation.
- Explain the basics of file handling mechanism.

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|---|----------|----------|----------|----------|
| <b>U14MET101/ ENGINEERING GRAPHICS</b>                        | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
| <b>(Common to all branches of Engineering and Technology)</b> | <b>2</b> | <b>0</b> | <b>3</b> | <b>3</b> |

## **OBJECTIVES**

- To understand the principle of orthographic projection of points, lines, surfaces and solids.
- To understand the principle of section and development of solids.
- To understand the principle of Isometric and Perspective projections.
- To study the principle of free-hand sketching techniques.

## **PLANE CURVES, PROJECTION OF POINTS AND LINES**

**15 Hours**

Importance of graphics in design process, visualization, communication, documentation and drafting tools, Construction of curves - ellipse, parabola, and hyperbola by eccentricity method only. Orthographic projection of points.

Projections of straight lines located in first quadrant - determination of true length and true inclinations.

## **PROJECTIONS OF SURFACES AND SOLIDS**

**15 Hours**

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

## **SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES**

**15 Hours**

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

## **PICTORIAL PROJECTIONS**

**15 Hours**

Isometric projection, Isometric scale, Isometric views of simple solids, truncated prisms, pyramids, cylinders and cones.

Perspective projection of prisms and pyramids when its base resting on the ground by vanishing point method.

## **FREE-HAND SKETCHING**

**15 Hours**

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

Sketching pictorial views from given orthographic views.

**L: 30 Hr, P: 45 Hr, TOTAL: 75 Hours**

## **REFERENCES**

1. Basant Agrawal and CM Agrawal, Engineering Drawing, McGraw-Hill, New Delhi, First Edition, 2008.
2. Venugopal K. and Prabhu Raja V., Engineering Graphics, New Age International (P) Limited, New Delhi, 2008.
3. Natarajan K.V., Engineering Drawing and Graphics, Dhanalakshmi Publisher, Chennai, 2005.
4. Warren J. Luzadder and Jon. M. Duff, Fundamentals of Engineering Drawing, Prentice Hall of India Pvt. Ltd., New Delhi, Eleventh Edition, 2005.
5. Gopalakrishna K.R., Engineering Drawing (Vol. I & II), Subhas Publications, 2001.

## **COURSE OUTCOMES**

- Construct various plane curves and projection of lines and surfaces.
- Develop projection of solids, sections of solids and surfaces.
- Apply the concepts of isometric, perspective and free hand sketching in engineering practice.

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|---|----------|----------|----------|----------|
| <b>U14CHP101/ U14CHP201 CHEMISTRY LABORATORY</b><br><b>(Common to all branches of Engineering and Technology)</b> | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
|   | <b>0</b> | <b>0</b> | <b>3</b> | <b>1</b> |

## **OBJECTIVES**

- To apply the theoretical principles and perform experiments
- Experience the importance of theory by using analytical equipments and quantitative and qualitative procedures.

## **LIST OF EXPERIMENTS**

### **PREPARATION OF SOLUTIONS (STANDARD)**

1. Preparation of normal solutions of the following substances - oxalic acid, sodium carbonate, hydrochloric acid.
2. Preparation of phosphate buffer using Henderson equation.

### **WATER TESTING**

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

### **ELECTRO CHEMICAL ANALYSIS**

7. Estimation of hydrochloric acid by pH metry.
8. Conductometric titration of mixture of acids and strong base
9. Conductometric precipitation titration using BaCl<sub>2</sub> and Na<sub>2</sub>SO<sub>4</sub>.
10. Estimation of Iron by Potentiometry

### **PHOTOMETRY**

11. Estimation of the Ferrous ions (Thiocyanate method) by Spectrophotometry.
12. Estimation of sodium and potassium by Flame photometry.

**TOTAL: 45 HOURS**

## **REFERENCES**

1. Jeffery G.H., Bassett J., Mendham J. and Denny R.C., Vogel's Text Book of Quantitative Chemical Analysis, Oxford, ELBS, London, 2002.
2. Shoemaker D.P. and C.W. Garland., Experiments in Physical Chemistry, TataMcGraw-Hill Pub. Co., Ltd., London, 2003.
3. Shoba U.S., Sivahari R. and Mayildurai R., Practical Chemistry, Inder Publications, Coimbatore, 2009.

## **COURSE OUTCOMES**

- Prepare normal solutions
- Analyse the properties of water by applying the chemical concepts
- Estimate the concentration of solutions by electrochemical methods and apply it in real life situations like blood testing etc



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|---|----------|----------|----------|----------|
| <b>U14PHP101/ U14PHP201 PHYSICS LABORATORY</b>                | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
| <b>(Common to all branches of Engineering and Technology)</b> | <b>0</b> | <b>0</b> | <b>3</b> | <b>1</b> |

## **OBJECTIVES**

- The experiments are designed to illustrate phenomena in different areas of Physics and to expose you to measuring instruments.
- The laboratory provides a unique opportunity to validate physical theories in a quantitative manner.
- Laboratory experience demonstrates the limitations in the application of physical theories to real physical situations.
- In general, the purpose of these laboratory exercises is both to demonstrate some physical principle and to teach techniques of careful measurement

## **LIST OF EXPERIMENTS**

### **Any Ten Experiments**

1. Lee's disc - determination of thermal conductivity of a bad conductor
2. Air wedge - determination of thickness of a given specimen.
3. Spectrometer - determination of wavelength of mercury source using grating
4. Compound pendulum - determination of acceleration due to gravity.
5. Carey foster bridge – determination of specific resistance of given coil of wire.
6. Viscosity - determination of coefficient of viscosity of a liquid by Poiseuille's flow method.
7. Non-uniform bending – determination of Young's modulus
8. Ultrasonic interferometer –determination of velocity of sound and compressibility of liquid.
9. Band gap determination of a semiconductor using post office box
10. Semiconductor laser:
  - a. Determination of wavelength of laser using grating
  - b. Particle size determination
  - c. Acceptance angle of optical fibre
11. Torsional pendulum - determination of Rigidity modulus of the wire
12. Field along the axis of a coil – Determination of magnetic moment.

### **Demonstration experiments:**

1. Determination of solar cell parameters
2. Hall effect
3. Four probe apparatus
4. Animations –(Laser,Fiber optics and hysteresis curve)

**TOTAL: 45 HOURS**

## **COURSE OUTCOMES**

- Determine different physical properties of a material like the thermal conductivity thickness of the material, etc.
- Perform experiments involving the physical phenomena like interference and diffraction.
- Apply physical theories in real life situations by also taking into account its limitations

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|---|----------|----------|----------|----------|
| <b>U14CSP101/ STRUCTURED PROGRAMMING<br/>LABORATORY USING C</b> | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
|   | <b>0</b> | <b>0</b> | <b>3</b> | <b>1</b> |

**(Common to all branches of Engineering and Technology)**

## **OBJECTIVES**

- To enable students to solve problems using C
- To apply the various features of C

## **LIST OF EXPERIMENTS**

1. Simple programs
  - To find whether the given number is prime or not
  - Factorial of the given number
2. Programs involving Control and Looping Structures
  - Arithmetic Progression
  - Trigonometric series evaluation
3. Programs using Arrays
  - Sorting
  - Matrix addition and Multiplication
4. Calculation of median of a frequency distribution.
5. Evaluation of integrals
  - Trapezoidal Rule
6. String Processing
7. Program using Recursive function
8. Using pointers in C
9. Program using Functions, Structures and Files
  - Students Mark Analysis
10. Iterative method for finding Roots of the polynomials
  - Lagrange interpolation method

**TOTAL: 45 HOURS**

## **COURSE OUTCOMES**

- Develop algorithms, flowcharts and programs to solve a given problem.
- Demonstrate code reusability using recursive and non-recursive functions.
- Implement pointers, memory allocation techniques and files in 'C' language.
- Apply and practice logical ability to solve simple problems.
- Demonstrate 'C' programs for statistical and scientific problem solving.

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|---|----------|----------|----------|----------|
| <b>U14MEP101/ ENGINEERING PRACTICES LABORATORY</b>            | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
| <b>(Common to all branches of Engineering and Technology)</b> | <b>0</b> | <b>0</b> | <b>3</b> | <b>1</b> |

## **LIST OF EXPERIMENTS**

### **GROUP – I**

**21 Hours**

#### **A. CIVIL ENGINEERING**

##### **1. Carpentry**

- Study of carpentry tools
- Preparation of T joint
- Preparation of dovetail joint

##### **2. Plumbing**

- Study of pipeline joints

#### **B. MECHANICAL ENGINEERING**

##### **1. Fitting**

- Study of fitting tools
- Preparation of L joint
- Preparation of square joint

##### **2. Sheet Metal Working**

- Study of sheet metal working tools
- Preparation of cone and tray

##### **3. Welding**

- Study of arc welding tools and equipment
- Preparation of butt joint

### **GROUP - II (ELECTRICAL & ELECTRONICS ENGINEERING)**

#### **C. ELECTRICAL ENGINEERING PRACTICE**

**12 Hours**

- Basic household wiring using switches, fuse, indicator-lamp, etc.,
- Preparation of wiring diagrams.
- Stair case light wiring.
- Tube light wiring
- Study of iron-box, fan with regulator, emergency lamp and microwave oven.

#### **D. ELECTRONIC ENGINEERING PRACTICE**

**12 Hours**

1. Assembling simple electronic component on a small PCB and Testing.
2. Soldering simple electronic circuits and checking continuity.
3. Measurements using digital multimeter.
  - DC and AC voltage measurement
  - DC and AC current measurements.
  - Resistance Measurement.
  - Continuity measurement.
4. Testing of Electronic components
  - Resistors
  - Inductors and capacitors
  - Diodes (resistance in forward bias and reverse bias)
  - Transistors
5. Study of CRO and Function generator
  - Study of Panel Controls
  - Measurement of Amplitude, Frequency, phase difference

**TOTAL: 45 HOURS**

#### **COURSE OUTCOMES**

- Select the various tools and equipments used in the fabrication workshop.
- Develop various models in carpentry, fitting, sheet metal work and welding.
- Demonstrate and evaluate the parameters of basic electronic components (wires, resistors, capacitors, diodes etc.) and test the components.
- Estimate DC and AC Voltage and currents using appropriate measuring instruments.

|   |          |          |          |          |
|---|----------|----------|----------|----------|
| <b>U14GHP101/ PERSONAL VALUES – I</b>                         | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
| <b>(Common to all branches of Engineering and Technology)</b> | <b>1</b> | <b>0</b> | <b>1</b> | <b>1</b> |

## OBJECTIVE

- To inspire students to become best Humans.
- To know about self.
- To overcome evil temperaments.
- To live with sound health.
- To reach Intuition.

## HUMAN LIFE & EXCELLENCE

**4 Hours**

**Human Excellence:** Introduction – objective – personal values - importance.

**Life** : Self – Society – Nature – Yoga – purpose of life – philosophy of Human life.

**Body, Soul, Mind & Their Functional Relationship :** Panchboothas and it's association – Form of the body : physical body, astral body, causal body - Effect: Pain, Disease, Death; Soul – Life force – Bio magnetism – Genetic Centre – Mind : Origin & it's ten stages.

## INTROSPECTION & THOUGHT ANALYSIS

**4 Hours**

Introduction – Importance – Blemishes – Six evil temperaments & their maneuvering.

**Thought analysis:** Introduction - process of thought – Mind & Thought relationship – causes for origin of thoughts

**Exercise:** Training & Practice of Thought analysis

## MORALIZATION OF DESIRE

**2 Hours**

**Desire :** Introduction – Causes – Types – Contra qualities evolving out of desire – Effect of unfulfilled desire – Renunciation – Is attainment of desire in harmony with Law of Nature.

**Training :** Moralization of Desire.

## NEUTRALIZATION OF ANGER

**2 Hours**

Introduction – Origin of Anger – Alternative forms of Anger – A chain action – Consequence of anger on self & others – Neutralization of anger – the point where anger is won.

**Training :** Neutralizing anger.

## ERADICATION OF WORRIES

**2 Hours**

Worry: Causes - Effects – Types of problems – Solution to problems – Overcoming Worries.

**Training** – Eradication of Worries.

**REALIZATION OF SELF****2 Hours**

Transformation Theory – Understating Self – Guru’s role in guiding – Who am I? – Shaping One’s destiny.

**Training** : Realization of self.

**THEORY & PRACTICAL SESSION ON PHYSICAL EXERCISE:****9 Hours**

Introduction – Hints & caution – Live in Health and harmony – Hand Exercise – Leg Exercise – Neuro muscular breathing Exercise – Kapalapathy – Magarasanas I & II – Massage – Acu-  
pressure – Body relaxation .

**MEDITATION****5 Hours**

Meditation: Agna Meditation – Shanthi Meditation.

**Total: 30 Hours****COURSE OUTCOMES**

- Acquire knowledge on the individual in relation to Nature and Society.
- Analysis purity of Thoughts, Moralization of Desire
- Learn about Neutralization of Anger.
- Develop skills in Sky yoga and Kaya kalpa.