SEMESTER-III

பருவம் **III**

தமிழ் – தாள் **- 3**

CODE: 16TIED31 **Credits:3 (2L:1T:0P)**

Hours: 4/Week

நோக்கங்கள்: -

1. தமிழ் மொழியின் வரலாற்றை அறிவியல் கண்ணோட்டத்துடனும் மொழிக்குடும்மங்களின் அடிப்படையுலும் விளக்குதல்
2. சங்க இலக்கியத்தை வழி மாணவர்களிக்கு பண்டைய மக்களின் வாழ்க்கை நிலையை அறியச் செய்தல்
3. படைப்பாற்றல் திறனை வளர்த்தல்
4. பயன்பாட்டு தமிழ் வழியாக மாணவர்களுக்கு எழுதும் திறன் பேச்சு திறனை வளர்த்தல்

அலகு -1 நாட்டுப்புறவியல்: -

நாட்டுப்புற இலக்கியம் – தோற்றம் – வளர்ச்சி – ஏட்டுயிலக்கியத்தில் நாட்டுப்புறத்தாக்கம் – நாட்டுப்புறக் கலைகள் – நாட்டுப்புற நம்பிக்கைகள் – பழமொழிகள்

அலகு 2 சிற்றிலக்கியங்கள்: -

சிற்றிலக்கியங்கள் – வகை – பரணி – கலிங்கத்துப்பரணி – குற்றாலக்குறவஞ்சி – பிள்ளைத்தமிழ் – மீனாட்சியம்மை பிள்ளைத்தமிழ் – தமிழ் விடுத்தூது – நந்திகலம்பம் – முக்கூடற்பள்ளு

அலகு – 3 இக்கால இலக்கியம்

புதுக்கவிதை – தோற்றம் – வளர்ச்சி – வகைகள் – ஆசிரியர்கள்

1. குக்கூ – மீரா
2. தீவெளி – லதா

அலகு – 4 இலக்கணம்

இலக்கணம் – வகைகள் – எழுத்து – சொல்

1. எழுதுது இலக்கணம்
2. சொல் இலக்கணம்

அலகு – 5 பயன்பாட்டுத் தமிழ்: -

1. சேகரித்தல் – வரையறை – பண்புகள் – மொழி ஆளுமை – மாதிரிகள் – செய்தி சேகரித்தலில் தொலைக்காட்சியின் பங்கு – பயிற்சிகள்
2. நேர்க்காணல் – வரையறை – நோக்கம் – ஆயத்தம் – வகைகள் – பயிற்சிகள்

COURSE OUTCOME

At the end of this course the students will be able to,

CO1: Appreciate the culture and heritage through folk tales.

CO2: Analyze the Tamil 'sitrilakkiyam'

CO3: Develop their creative writing and innovative poetry.

CO4: Analyze the grammatical rules.

CO5: Improve their functional language skills.

பார்வை நூல்கள்: -

- முனைவர். சு. சக்திவேல் – நாட்டுப்புறவியல் ஆய்வு, மாணிக்கவாசகர் பதிப்பகம்
- முனைவர்.சி. பாலசுப்பிரமணியன் – தமிழ் இலக்கிய வரலாறு, பாரி நிலையம்
- முனைவர்.பொற்கோ – தமிழை நீங்களும் தவறு இல்லாமல் எழுதலாம்
- கா.பட்டாபிராமன் – மொழிப் பயன்பாடு, நீயு செஞ்சுரி புக் வுவஸ்

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SEMESTER –III

HINDI – PAPER-3

CODE: 16IHED31 **Credits: 3 (2L: 1T: 0P)**

Hours: 4/Week

Objectives: Students develop proficiency in Hindi which equips them to

1. enable the students to acquire basic skills in functional language.
2. develop independent reading skills and reading for appreciating literary works.
3. internalise grammar rules so as to facilitate fluency in speech and writing .
4. develop functional and creative skills in language.
5. develop values of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

Transaction mode:

Lecture cum discussion, group discussion; panel discussion, seminar group work, library work.

COURSE CONTENT:

Unit - I: Functional Language:

a) Letter Drafting-Types of letters-E mails-language of letters-letters of famous people-exercises.
b) Essay writing- Characteristics –Definition-Format-format of essay-types of essays (literary, scientific etc)-models, exercises

Reference: A Handbook of Writing Activities, Prasaranga, University of Bangalore.

Unit - II: Translation from English to Hindi

References : Anuvad Vignan-Bholanath Tiwari

a) About Translation by Peter Newmark, MultiLingual Motters, Clavedon, UK. b) Aspect of Translation by K V V L Narasimha Rao, CIIL, Mysore

Unit - III: Medieval Literature :

Text- **Pracheen evam madhyakaleen Hindi Kavya**

Prof Poornachand Tandan (Ed.) Published by Rajpal and sons, Kashmiri gate, Delhi 110006. Following poets' work have been prescribed for study **Bihari, Ghananand, Dev** (One poem of each poet)

Unit - IV: Novel

Subhah, Dopahar, Sham by Kamaleshwar, Published by Rajpal and sons, Kashmiri gate, Delhi

Sessional work :

In the internal class during the different activities the performance of the student will be assessed by the teacher. Test, assignments and small projects works may be given .

COURSE OUTCOME

At the end of this course the students will be able to,

CO1: Improve their letter writing skill in Hindi

CO2: Develop their translation skills from their mother tongue to Hindi.

CO3: Interpret the thoughts and ideas of medieval literature.

CO4: Appreciate the novels and its novel ideas.

CO5: Analyze the grammatical rules.

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SEMESTER – III

ENGLISH – PAPER - 3

CODE: 16IEED31 **Credits: 3 (2L: 1T: 0P)**

Hours: 4/Week

Objectives: Students develop proficiency in English which equips them to

1. understand the demands of audience, subject, situation and purpose and the
2. use of language for effective communication.
3. analyse language in context to gain an understanding of grammar, vocabulary, spelling, punctuation and speech.
4. examine authentic literary and non-literary texts and develop insight and appreciation.
5. gain an understanding of study and reference skills.
6. plan, draft, edit and present a piece of writing.

Unit I : Grammar

Clauses : Noun Clause- Reported Speech and Change of Voice – Phrasal verb - Prepositional phrases.

Unit II : Comprehension Skills

Extracts from literary, scientific and educational journals.

Unit III : Advanced Writing Skills

Writing advertisement copy; Writing a project proposal, Writing Resume and writing a report, sending an application.

Unit IV : Skills of Communication

Presenting oneself at an interview, participating in group discussion.

Unit V : Literature – Short Poems

On His Blindness	- John Milton
The Village Schoolmaster	- Oliver Goldsmith
The Daffodils	- William Wordsworth
Night and Death	- Joseph Blanco White
The Ballad of Father Gilligan	- W.B.Yeats

Unit V: Composition

Letter writing: Personal, Business Letters - Hints development

COURSE OUTCOME

At the end of this course the students will be able to,

CO1: Utilize instructions on fundamentals of grammar.

CO2: Examine the difference between poetic language and the language of the prose.

CO3: Develop their own style of writing after studying advanced skills of writing.

CO4: Classify different types of letter based on their need.

CO5: Conclude the textual content of poetry.

Suggested Readings:

- Calkins, L (1994). *The Arts of Teaching Writing*. Heinemann
- Chan. et al. (1997*) Professional Writing Skills*, San Anselma, CA
- Fiderer, A. (1994) *Teaching Writing: A Workshop Approach*. Scholastic.
- Block, C.C.(1997). *Teaching the Language Arts*, 2nd Ed. Allyn and Bacon
- Mckay. et al. (1995). *The Communication Skills Book*, 2nd Ed. New Harbinger Publications**.**

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SEMESTER – III

EDUCATION IN CONTEMPORARY INDIA

CODE: 16CIED31 **Credits: 4 (3L: 1T: 0P)**

Hours: 5/Week

Objectives: On completion of the course, the student-teachers will be able to

1. understand the concepts of education and its objectives.
2. recognize major constitutional provisions for education.
3. acquire knowledge of universalisation of elementary education, RMSA.
4. understand the meaning and different types of Non- formal Education programmes in India.
5. understand the importance of values and Classify the hierarchy of values.
6. understand the need for value oriented education at all levels.

UNIT-I: Education Problems in Contemporary Indian Society

Education – Meaning. Aims and Objectives. Nature and Scope. Purpose and Process of Education. Types of Education. Problems in Contemporary Indian society (in the context of religion, language, race, social stratification) - Education in Pre-Independent India- Education in Post- Independent India.

Unit-II: Indian Constitutional Provisions and Education Commissions

The place of Education in the Indian Constitution- Right to Information Act- National Curriculum Framework (2005)-National Curriculum Framework for Teacher Education (2009) - The role of a teacher with reference to Fundamental rights and duties of the citizens. Recommendations of Education Commissions -Dr. Radha krishnan commission (1948-49), Mudaliar Commission (1952-53) - Indian Education Commission (1964-66)- National Policy of Education(1986)- Ramamurthy Review Committee(1992).

Unit-III: Educational Programmes of Quality Improvement for Education

Universal Elementary Education (UEE) - Sarva Shiksha Abhiyan- Objectives, Achievements and challenges – Right to Education. Rashtriya Madyamik Shiksha Abiyan (RMSA). Samacheer Kalvi.. Operation Black Board - Integrated Child Development services- Transit Schools-Education of Women and Under privileged Sections of Society.

UNIT- IV: Non Formal Education

Non Formal and Adult Education - Functional Literacy, Technology Mission for Literacy, Distance Education – National Open School, Open University and open Learning - National Literacy Mission-Mass Programme of Functional Literacy - Functional Literacy Programme for Farmers

UNIT-V: Value Education

Value: Meaning, Definition and Classification of Values, Importance of values, Hierarchy of Values. Role of Values in shaping the individual's personality. Value Education: Meaning, Objectives and Need of Value Education-Value Education in Schools, Methods of Teaching Values.

COURSE OUTCOME

At the end of this course the students will be able to,

CO1: Examine the educational problems in contemporary Indian society.

CO2: Differentiate education in pre and post independent India.

CO3: Appraise various Indian Constitutional provisions and education commission.

CO4: Formulate the objectives and need of value education

CO5: Conduct value-based activities in schools and colleges.

References:

- Aggarwal, J.C. (2008). Development of Education System in India, Shipra Publications.
- Annual Report 2008-2009, National Council for Teacher Education. (NCTE), New Delhi.
- Batra, Poonam. (2005). *Voice and Agency of Teachers: The Missing Link in the National Curriculum Framework. 2005,* EPW, October 1-7, pp. 4353.
- Biswa Ranjan Purkait. (1998). Great Educationists and their Philosophies, New Central Book Agency Pvt Ltd,.
- Chaube, S.P. (2013). *Problems of Indian Education*. Agra: Shri Vinod PustakMandir.
- Curriculum Framework for Teacher Education, draft 2006. New Delhi: National Council for Teacher Education (NCTE).
- Deshpande, S. (2004). *Contemporary India: A Sociological View*. New Delhi: Penguin Chapter 5: Caste inequalities in India Today.
- Glenn, L. (1970). *Philosophy and Education*. London: Macmillan Publication.
- Jagannath Mohanty. (2008). Modern Trends in Indian Education, Deep & Deep Publications Pvt Ltd,.
- James C Lawrence, (2010). Educational Philosophy, Rajat Publications.
- Kapila, U. (2009). *Indian Economy since Independence*. New Delhi: Academic Foundation. Chapter 1: Indian Economy at independence.
- Lakshmi, S. (1997). Educational Challenges in the Emerging Indian Society, Sterling Publishers, New Delhi.
- Mohit Chakrabarti. (2004). Value Education Changing perspectives (2nd Edition) New Delhi. Kanishka Publishers.
- Naseema, C. (2003). Human Rights Education, Kanishka Publishers, New Delhi.
- Qureshi, Muniruddin. (2005). *Social Aspects of Education*. New Delhi: Anmol publications pvt. Ltd.
- Rahul Rai. (1996). Human Rights UN Initiatives, Authors Press Publishers of Scholonly Boot, New Delhi.

- Ranganadananda, Swami. (1969). Eternal Values for a changing Society, Bombay, Bharatiya Vidya Bhavan.
- Rao, Digumarti Bhaskara (2013). *Right to Education*. New Delhi: Neelkamal publications pvt. Ltd.
- Swaroop Sarena, N.R.,& Chaturvedi, Shikha. (2012). *Teacher in Emerging Indian Society*. Meerut: Lall Book Depot.
- Vanaja M and Vijaya Bharathi D (2008) Value Oriented Education. Initiatives at the Teacher Education Level, Hyderabed; Neelkamal Publications.
- Working Group Report on Elementary Education and Literacy, XI Five Year Plan, 2007-12. New Delhi: Planning Commission of India.

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SEMESTER – III

TEACHING AND LEARNING – PART 1

CODE: 16CIED32 **Credits: 2(1L: 1T: 0P)**
Hours: 3/Week

Objectives: On completion of the course, the student-teachers will be able to

1. understand the importance of concept of learning and teaching;
2. acquire knowledge about principles and maxims of teaching;
3. acquire knowledge about the task of teaching;
4. understand the skills required for teaching
5. accept and understand the importance of modification in teachers' behaviour;
6. interpret and manage the learning and teaching process effectively;

UNIT-I: Understanding and Management of Teaching and Learning

Teaching: Concept, Meaning and definitions; Nature and characteristics of teaching; the relation of teaching with other similar concepts; Analytical concept of teaching.
Learning: Concept, Meaning and definition, Relationship between teaching and learning. Nature of learning– Learning as a process and learning as an outcome. Types of learning – Factual, association, conceptual, procedural, generalization, attitude, values, skills. Management of learning–Planning, organizing, executing, controlling and quality of learning.

UNIT-II: Teaching and Skills Associated with Teaching

Teaching: Concept, Meaning and definition - teaching as task of specialized professionals- General principles of teaching; psychological principles of teaching and maxims of teaching;
variables involved with teaching task - Phases and Operations of teaching task-The pre-active phase, interactive phase and post-active phase. Levels of teaching task-Memory level of teaching, understanding level and reflective level of teaching and skills associated involved in the three phases of teaching.

UNIT-III: Modification in Teacher Behaviour

Introduction: Modification of teacher behaviour, simulation teaching, t-group training, Interaction Analysis, Action Research, Micro teaching with special reference to components of various teaching skills.

COURSE OUTCOME

At the end of this course the students will be able to,

CO1: Execute the skills required for teaching

CO2: Examine the knowledge about the principles of teaching

CO3: Organizing the learning and teaching process effectively

CO4: Appraise the importance of modification in teacher's behavior

CO5: Implement the strategies of teaching methods in classroom.

References:

- Bob Burkill., & Ray Eaton. (2011*). Developing Teaching and Learning*. London: Cambridge University Press.
- Derek, Rowntree. (1986).*Teaching through self-instruction*. London: Kogan page.
- Jaya Pillai, K. (1985). Effective teaching. Madurai: publishing division, Madurai Kamarajar University.
- Kulkarni,S.S.(1986*). Introduction to Educational technology.* Bombay: Oxford and IBH Publishing Co.
- Kumaraswamy Pillai, K. (198*0). Curriculum, Teaching and Evaluation*. Annamalai Nagar: Sivakami Printers.
- Mangal,S.K.(1986*). Fundamentals of Educational Technology*. Ludhiana: Prakash Brothers.
- NCTE. (1998*). Competency Based and Commitment Oriented Teacher Education for Quality School Education*. New Delhi: NCTE Initiation Document 98/21.
- Ramesh Varma., & Suresh Sharma. (1998*). Modern Trends in Teaching Technology*. New Delhi: Anmol Publications.
- Sampath, K. (1981*). Introduction to Educational Technology*. New Delhi: Sterling Publishing Pvt. Ltd.
- Sharma Prem Latha. (2006). *Learning Readiness*. New Delhi: Roshan Offset Printers.
- Sharma, Motilal. (1985). *Systems Approach: Its Application in Education*. Bombay: Himalaya Publishing House.
- Sharma, R.A. (1991). *Technology of Teaching*. Meerut: R.Lall Book Depot.
- Sharma,R.A. (1982*). Programmed Instruction and Instructional Technology.* Meerut: International Publishing House.
- Siddiqui, M.H., & Khan, M.S. (1991*). Models of Teaching:Theory and Research.* New Delhi: Ashish Publishing House.
- Thomas, Mathew. (2009). *Effective Teaching*. New Delhi: S. Chand and Company.

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SEMESTER-III

MATHEMATICS – PAPER - IV

DIFFERENTIAL EQUATIONS

Code: 16EIED32 **Credits: 3 (2L:1T:0P)**
Hours: 4/Week

Objectives: To enable students to

1. gain logical skills in the formulation of differential equations
2. expose students to different techniques of finding solution to these equations
3. know the basics for Mathematical modeling

UNIT – I: Equations of first order but of higher degree – Equations solvable for p – Equations solvable for x – Equations solvable for y – Clairaut's Equation
Book 1 Chapter 1 Sections 5.1, 5.2 ,5.3, 5.4, 6.1

UNIT – II: Method of undetermined coefficient, Method of variation of parameters, Linear Differential Equations with constant coefficients
Book 2 Chapter 5 Sections 5.4, 5.5, 5.6

UNIT – III: Bernoulli's equations, Cauchy – Euler equation, Legendre linear equations
Book 1 Chapter 1 Section 2.5 Book 2 Chapter 5, Section 5.7, 5.8

UNIT – IV: Exact equations , Total Differential Equations, Lagrange's equations,
I.F $\frac{1}{Mx+Ny}$, $\frac{1}{Mx-Ny}$, $\frac{\frac{\partial M}{\partial y}-\frac{\partial N}{\partial x}}{N}$, $\frac{\frac{\partial N}{\partial x}-\frac{\partial M}{\partial y}}{M}$
Book1 Chapter 1 Section 3.1 Chapter 3 Section 7 Chapter 4 Section 6

UNIT – V: Formation of P.D.E Complete integrals, particular integrals, singular integrals, equations solving by direct integration, linear equations of the first order – non- linear equations of the first order- The four standard forms .
Book 1 Chapter 4 Section2.1, 2.2, 3, 4, 5.1, 5.2, 5.3, 5.4

COURSE OUTCOME

At the end of this course the students will be able to,

CO1: Classify the differential equation and solve for p , x, and y

CO2: Find the complementary function and particular integral of second order differential equations.

CO3: Categorize the PDE based on arbitrary constants and arbitrary functions

CO4: Explain the method of variation of parameters for the second order differential equations.

CO5: Identify the method of the homogenous equation of linear PDE.

Reference Books:

- Calculus – S. Narayanan and T. K. Manicavachagom Pillay.
- M.D. Raisinghania, Ordinary & Partial Differential Equations, S. Chand & Co.,
- M. K. Venkataraman, Engineering Mathematics, S. V. Publicaitons, 1985, Revised Edn.
- P.R. Vittal , Differential Equations and Laplace transformations
- Singaravalu, Differential Equations Fourier Series and Laplace transforms

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SEMESTER-III

MATHEMATICS – PAPER - V

ALGEBRAIC STRUCTURES

CODE: 16EIED33 **Credits: 3 (2L:1T:0P)**
Hours: 4/Week

Objectives: To enable students to

1. analyze and understand theorems on algebraic concepts
2. apply the algebraic concepts in Mathematical Sciences.
3. understand the concepts of characteristic roots and matrices etc.,

UNIT – I: Groups – definitions- subgroups – A counting principle – quotient groups – homomorphism – isomorphisms – automorphisms.

UNIT – II: Rings – definitions – examples-some special classes of rings – homomorphism – ideals, more ideals and quotient rings.

UNIT – III: The field of quotients of an integral domain – Euclidean rings – A particular Euclidean rings.

UNIT – IV: Vector space – Linear Independence and bases – Dual space – inner product space.

UNIT – V: Linear transformation – Algebra of linear transformation – characteristic roots – matrices – canonical forms – triangular form.

COURSE OUTCOME

At the end of this course the students will be able to,

CO1: Understand basic concepts of Groups, Properties, Permutations Groups.

CO2: Analyze the theorems of Algebraic structures.

CO3: Prove the Concepts of Rings, Subrings, Quotient rings

CO4: Illustrate Fields of quotients of an integral domain and Euclidean rings

CO5: Apply the algebraic concepts in Mathematical Sciences.

Reference Books:

- N. Herstein, Topics in Algebra, Wiley Eastern Ltd., NewDelhi.
- K.Viswanatha Naik,Modern Algebra, Emerald publishers

- N.S. Gopapakrishnan, University Algebra,New Age International (P) Limited, Publishers., New Delhi.
- S.Arumugan , Modern Algebra, Scitech Publications, Chennai.
- M. L. Santiago (1988) Modern Algebra Arul Publication, Chennai

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SEMESTER-III

PHYSICS – PAPER - 3

ELECTRICITY AND MAGNETISM

CODE: 16EIED31 **Credits: 4 (3L:0T:1P)**
HOURS: 5/Week

Objectives: To enable students to

- study Gauss theorem and its applications
- study the principle of Magneto-statics, magnetic effects of electric current and their applications.
- understand the working of potentiometer and its uses
- understand the principle of electromagnetic induction and ac circuits and network theorem.

Unit - I: Electrostatics

Point charge - Rest charge - charge distributions - coulomb's law – vector form - Principle of superposition - electric field strength - Electric field due to uniform line charge, charged ring at an axial point - Electric dipole – The concept of a solid angle - Gauss theorem and its differential form – Electric potential energy - Potential difference - Zero potential - Principle of superposition for potential - Potential due to a point charge- uniformly charged disc, spherical conductor - Poisson's and Laplace equations.

Unit - II: Magneto statics

Definition of B - Lorentz force - magnetic field intensity H - magnetic shell - Hall effect - Cyclotron - Ampere's circuital theorem - applications - field at a point inside a long cylindrical wire - magnetic vector potential- magnetic susceptibility and relative permeability - classification of magnetic materials - Properties of magnetic materials - susceptibility determination (Gouy's and Quincke's method - Experimental determination of hysteresis loop.

Unit - III: Magnetic effects of current

Biot and Savart law - field due to a straight wire - field on the axis of a circular coil - field due to a solenoid - Torque on a current loop in a uniform field - force on a current carrying conductor in a magnetic field - Theory of moving coil galvanometer - Applications of BG - Figure of merit - comparison of e.m.f of two cells and capacitances.

Unit - IV: Current Electricity

Current and current density - equation of continuity - resistance - Ohm's law - combination of resistance star and Delta transformations - grouping of cells - Kirchoff's

laws - Wheatstone Bridge - Carry - Foster's Bridge - Potentiometer - uses - Low resistance - Measurement of a very small e.m.f – growth and decay of current in inductor - charge and discharge of a capacitor through a resistance - Measurement of high resistance by leakage method - Physics of the LC Oscillator.

Unit - V: Electro Magnetic Induction and A.C.circuits

Faraday's laws - differential form - induced current and eddy currents -charge - self inductance - self inductance of a long straight solenoid - Rayleigh's method of self inductance - Mutual inductance – resistivity relation - coefficient of coupling - Determination of mutual inductance using B.G - Earth inductor - Measurement of horizontal, vertical component of B and angle of dip - Dynamo - D.C generator - D.C Motor.

COURSE OUTCOME

At the end of this course the students will be able to,

CO1: Understand the basic concepts of electrostatics and its applications.

CO2: Apply the concepts of magnetostatics and its experimental techniques in project preparation.

CO3: Identify the various concepts involved in AC and DC circuits.

CO4: Understand the magnetic effect of electric current used in various galvanometer and its instrumentation techniques.

CO5: Develop the design, fabrication, and characterization techniques for the self and mutual inductances.

Reference Books

- Sehgal - Chopra - Sehgal, Electricity and magnetism, Sultan Chand and Sons Ltd, New Delhi, 6th edition reprint, 2010.
- K K Tewari, Electricity and magnetism, S. Chand & Co. Ltd., NewDelhi, Reprint 2003.

Physics Practicals – III

Paper – III

Any Seven Practicals

1. Spectrometer – Grating (N&λ).
2. Spectrometer – i-d curve.
3. Spectrometer – Dispersive Power of Grating.

4. Young's modulus - Uniform Bending.
5. Junction diode & Zener diode Characteristics.
6. K- Lees disc.
7. Field along the axial of coil – vibration magnetometer.
8. Potentiometer – high range voltmeter.

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SEMSTER-III

CHEMISTRY – PAPER-III

CHEMICAL KINETICS AND PHASE RULE

CODE: 16CIED33 **Credits: 4 (3L: 0T: 1P)**

Hours: 5/Week

Course objective: To know about chemical kinetics, catalysis rate determination, phases and its concepts: components, degrees of freedom, phase diagram.

Unit-1: Phase Equilibria-I

Phase Rule: Concepts of phase, component and degrees of freedom, with examples. Gibb's phase rule phase diagram and application of phase rule: *One-component system*- Water and sulphur systems. *Two component system*- Simple eutectic: Lead-silver system.

Unit-2: Phase Equilibria-II

Distribution law statement and limitations applications to simple systems involving association, dissociation and complex formation. Solid-liquid equilibria -Binary systems. Theory of fractional crystallization Binary systems forming salt hydrates $FeCl_3$ - freezing mixtures NaCl, $CaCl_2$.

Unit-3: Chemical Kinetics-I

Rate of a reaction - Rate equation- Rate constant, Order and Molecularity - Methods of rate measurement. Derivation of kinetic equation for rate constants of I, II order reactions - Third and zero order reactions and examples (No derivation of rate constant). Rate determining step and mechanism of elemental process - Arrhenius law- activation energy.

Unit 4: Chemical Kinetics-II

Collision theory of reaction rates, collision cross section, collision number. Effect of solvent and ionic strength on reaction rates. Unimolecular reactions steady state treatment Lindemann hypothesis Chain reaction.

Unit 5: Chemical Kinetics-III

Homogeneous and Heterogenous Catalysis - definition - examples and differences. Reactions in gases and in solutions (Acid, base and Wilkinson's catalysts). Enzyme catalysis elementary of the principle of the activated complex using steady state treatment Michaelis - Menten kinetics.

COURSE OUTCOME

At the end of this course the students will be able to,

CO1: Understand the various concepts of degrees of freedom

CO2: Interpret the theory of fractional crystallization and binary systems.

CO3: Develop the concepts of chemical kinetics.

CO4: Prove the theory of catalysis rate determination.

CO5: Identify the concepts of chemical kinetics.

Text Books:

- P.L. Soni, " Text Book of Physical Chemistry" Sultan Chand & sons, 12th edition, **2010**
- B. R. Puri, L. R. Sharma, Pathania, "principle of Physical Chemistry" Vishal Publishing & Co., 46th edition **2013**

Reference Books:

- Kundu and Jain, "Physical Chemistry" S. Chand, 6th edition, **2011**
- S. Glasstone, "Text Book of Physical Chemistry" –Macmillan. 7th edition **2012**

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CHEMISTRY
PRACTICAL-III

Determination of the order of the following reactions.

1. Iodination of acetone
2. Saponification of an ester (ethyl acetate)
3. Acid catalyzed hydrolysis of an ester (ethyl acetate)

Distribution Law

4. Iodination of carbon tetra chloride
5. Saponification of an ester (ethyl acetate)
6. Acid catalyzed hydrolysis of an ester (ethyl acetate)

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