

## SEMESTER-II

பருவம் II  
தமிழ்- தாள் - 2

CODE: 16TIED21

Credits: 3 (2L: 1T: 0P)

Hours: 4/Week

நோக்கங்கள்:-

- தமிழ் மொழியின் வரலாற்றை அறிவியல் கண்ணோட்டத்துடனும் மொழிக்குடும்பங்களின் அடிப்படையிலும் விளக்குதல்
- சங்க இலக்கியத்தை வழி மாணவர்களுக்கு பண்டைய மக்களின் வாழ்க்கை நிலையை அறியச் செய்தல்
- படைப்பாற்றல் திறனை வளர்த்தல்
- பயன்பாட்டு தமிழ் வழியாக மாணவர்களுக்கு எழுதும் திறன் பேச்சு திறனை வளர்த்தல்

**அலகு - 1 தமிழ் மொழி வரலாறு**

மொழிக்குடும்பம் - இந்திய மொழிக்குடும்பங்கள் - இந்திய ஆட்சி மொழிகள் - திராவிட மொழிக்குடும்பங்கள் - திராவிட மொழிகளின் சிறப்புகள் - திராவிட மொழிகளுள் தமிழின் இடம் - தமிழ்மொழியின் சிறப்புகள் - தமிழ் பிறமொழித் தொடர்புகள்

**அலகு - 2 சங்க இலக்கியம்**

சங்க இலக்கியம் - எட்டுத்தொகை - நற்றினை - குறுந்தொகை - ஐங்குறுநூறு - பதிற்றுப்பத்து - பரிபாடல் - கலித்தொகை - அகநானூறு - புறநானூறு - பத்துப்பாட்டு - திருமுருகாற்றுப்படை - சிறுபாணாற்றுப்படை - பெரும்பாணாற்றுப்படை - பொருநராற்றுப்படை - மலைபடுகடாம் - குறிஞ்சிப்பாட்டு - முல்லைப்பாட்டு, பட்டினப்பாலை - நெடுநல்வாடை - மதுரைகாஞ்சி

**அலகு - 3**

வைரமுத்து எழுதிய “ சிற்பியே உன்னைச் செதுக்குகிறேன்” முழுவதும்

**அலகு - 4**

நாடகம் - தோற்றம் - வளர்ச்சி - நாடக ஆசிரியர்கள் நாடக வகைகள் - பயிற்சி

**நாடகம்:** - தண்ணீர் தண்ணீர் - கோமல் சுவாமிநாதன், வானதி பதிப்பகம், தி.நகர் - சென்னை - 600017

**அலகு - 5 - பயன்பாட்டுத்தமிழ்**

கடிதம் - கடித வகைகள் - அலுவலகக்கடிதங்கள் - விண்ணப்பக் கடிதம் - கடிதத்தில் கையாளும் மொழி - இ.மெயில் - பயிற்சிகள்

கட்டுரை – கட்டுரை எழுதுதல் – பண்புகள் – வரையறை வகைகள் –  
கட்டுரை எழுதும் முறை – பயிற்சிகள்

### **COURSE OUTCOME**

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

- CO1: Measure human mind through the studying of Tamil classical literature in the aspect of moral value.
- CO2: Justify the contemporary social issues through studying Tamil Epics.
- CO3: Improve their own style of writing after studying Sirpiye Unnai sethukkukiren essays.
- CO4: Develop narrative skill after reading short stories.
- CO5: Build the life skills after studying of the poetry.

### **பார்வை நூல்கள்: -**

1. சக்திவேல்.சு “தமிழ் மொழி வரலாறு”, மணிவாசகர் பதிப்பகம், முதற் பதிப்பு 1998
2. விமலானந்தம், மது.ச., :இலக்கியவரலாறு:. பாரி நிலையம், மறுபதிப்பு,2008
3. அ.கி பரந்தாமனார்:நல்ல தமிழ் எழுத வேண்டுமா? பாரி நிலையம், சென்னை – 600108
4. கா.பட்டாபிராமன், மொழிப்பயன்பாடு – (நீயு செஞ்சரி புக் ஓவஸ்)

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**SEMESTER – II**  
**HINDI – PAPER-2**

**CODE:** 16IHED21

**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: Descriptive Grammar**

**Samasa and Alankara** ( Yamak, Shlesh, Upama, Rupak, Apahnuti, Utpreksha, Drishtanta, Virodhabasa, Arthantharanyas, Ananvaya).

**Reference Book:** a) Hindi Vyakaran—N.Nagappa, b) Kavya ke Vibhinna Ang -- Dr. Krishna Narayan Prasad Magadh

**Unit - II: Functional Language:**

**News reporting:** Characteristics-Definition-language of news reporting-model of news report-patterns-role of media in news reporting-exercises.

**Interview:** Characteristics-definitions-preparation for interview-various types of interviews (business-employment-literary etc.) - exercises.

**References:**

- a) Fundamentals of Journalism, Report Writing and Editing by R.Thomas Berner, Marquette Books LLC, Washington.
- b) The Perfect Interview by Max Eggert, Random House, UK.

**Unit - III: Medieval Poetry**

Text- **Pracheen evam madhyakaleen Hindi Kavya.** Prof Poornachand Tandan (Ed.)  
Published by Rajpal and sons, Kashmiri gate, Delhi-110006

Following poets' work will be taught: **Tulasidas, Surdas, Meerabai** (one poem of each poet)

**Unit - IV: Collection of Essays:**

**Shresht Nibandh-** Dr. Aalok Gupta (Ed.) published by Shiksha Bharathi, Madarasa Road, Kashmiri Gate, Delhi –110006

Prescribed essays:

- a) Sahitya ki mahatta b) Pahla safed bal c) Gehun banam gulab d) Devdary  
e) Sahitya aur Jeevan

**COURSE OUTCOME**

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

CO1: Use descriptive grammar in writing the Hindi language.

CO2: Understand the multimedia report writing.

CO3: Analyze the medieval poetry.

CO4: Points out the problems occur due to carelessness lack of communication

CO5: Build the skill of story writing.

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**SEMESTER – II**  
**ENGLISH – PAPER - 2**

**Code:** 16IEED21

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

**Objectives:** Students develop proficiency in English which equips them to

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

**Unit I: Descriptive Grammar**

Function of Auxiliaries; Modals; Question form - Framing questions - Wh – Questions - Question tags

**Unit II: Development of Reading skills.**

Silent reading, loud reading - SQR3 method of reading – Skimming – Scanning

**Unit III: Development of writing skills.**

Mechanical skill - Paragraph writing - Essay Writing – Summery Writing

**Unit IV: Literature – Short Stories**

|                        |                      |
|------------------------|----------------------|
| Open Window            | - H. H. Munro (Saki) |
| The Lion's Share       | - Arnold Bennett     |
| The Sparrows           | - K.A. Abbas         |
| The Cop and The Anthem | - O.Henry            |
| The Necklace           | - Guyde Maupassant   |

**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: Examine the difference between poetic language and the language of the prose.
- CO2: Utilize instructions on fundamentals of grammar.
- CO3: Develop their own style of writing after studying diverse prose essays.
- CO4: Classify different poems based on their types.
- CO5: Conclude the textual content of both and poetry.

**Suggested Readings:**

- 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.
- Rao,Shoba B, *Empower with English,Sunbeams-II*. Emerald Pub:Chennai,2012

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**SEMESTER-II**  
**HEALTH, PHYSICAL FITNESS & YOGA**

**CODE:** 16CIED21

**Credits: 2 (1L-0.5T-0.5P)**  
**Hours:3/Week**

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

1. create awareness on different aspects of health and fitness;
2. recognize the importance of hygiene for healthy living;
3. appreciate the importance of correct posture;
4. create an awareness of the rules of safety and importance of first aid;
5. evaluate ones present physical fitness status
6. provide the basis for setting-up an exercise programme;
7. acquire the importance of weight management through exercise and diet;
8. expound to cope up with daily stress.

**UNIT-I: Introduction to Health Education and First Aid**

Meaning, Definition, Aims & Objectives of Health Education, Methods of Imparting Health Education in Schools – Health Instruction, Health Services, Health Supervision. Personal hygiene - Meaning, Definition, Elements and Importance of Personal hygiene.

**Posture Management:** Meaning of Posture, Importance of Good posture, Causes of Poor Posture, Preventive Measures, Proper posture in various situations ,Common Postural Defects - Kyphosis, Lordosis, Scoliosis, Knock Knee ,Bow Legs and Flat Foot, Exercises for improving Postural Defects.

**First Aid and Treatment:** First aid - Meaning, definition, Scope, Qualities of a first aider, Basic principles of rendering first aid, First aid box Contents, First aid for different types of accidents – Sprain, Stain, Contusion, Bleeding, Dislocation, Fracture, Burns, Electric Shock, Heat Stroke, Drowning and Snake bites - Symptom, Prevention and Treatment.

**UNIT-II: Physical Fitness and Assessment**

Meaning, Definition, Importance of physical fitness, factors influencing physical fitness, Health related Components : Strength ,Muscular Endurance , Flexibility, Cardio-Respiratory Endurance and Body Composition, Benefits of physical fitness, Assessment of physical fitness, Planning a fitness programme, Common injuries :Plantar Fasciitis, Achilles tendinitis, Chondromalacia, Hamstring Strain, Shin splints -Prevention and Treatment.

**UNIT-III: Stress Management and Yoga**

Weight management - Definition, Meaning, Factors contributing to weight management, Exercise – Definition, Meaning, Types : Aerobic exercise , Flexibility exercise, Strength exercise -Role of exercise in weight management, Misconception about exercise and weight control: Exercise and appetite, Spot reducing, Weight reduction by sweating, Diet

- Balanced diet, Food groups- A guide to menu planning, Role of diet in weight management.

**Stress Management:** Meaning, Definition, Causes and effects of stress, managing stress - Exercise, Relaxation techniques-Deep breathing, Progressive muscular relaxation.

**Yoga** - Introduction, Meaning and misconceptions of Yoga; Ashtang Yoga (8 stages of Yoga); Types of Yoga; Importance of Yogasanas, Pranayama and Shudhikriya; Importance of Meditation in school.

## PRACTICAL

1. Assessment of health related physical fitness (H.R.P.F.)
  - a) Body composition: Body Mass Index (B.M.I.) and Waist HipRatio (W.H.R.)
  - b) Cardio-respiratory endurance
  - c) Muscular strength and endurance
  - d) Flexibility
2. Yogasana, Pranayama and Shudhikriya.

## COURSE OUTCOME

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

- CO1: Appraise health education and first aid
- CO2: Select the appropriate postures for preventing measures for improving postural defects
- CO3: Support with appropriate first aid and treatment
- CO4: Value weight management, stress management and yoga
- CO5: Expound to cope up with daily stress.

## References:

- Aggarwal, J.C. (2013). *Health and Physical Education*. NewDelhi: Shipra Publications.
- Bass, David H. (1996). *Your personal fitness trainer*. New Delhi: BPB Publications.
- Charles, P. (1998). *A key to stay fit*. Delhi: Shanthi Publication.
- Daryl, Syedentop. (1994). *Introduction to physical education, fitness and sports* (2nd ed.). London: Mayfield publishing company.
- Dharmendra prakash Bhatt. (2006). *Health Education*. New Delhi:Khel Sahitya Kendra.
- Getchell, Bud. (1992). *Physical fitness: A Way of Life*. America: Macmillian publishing company.
- Greenberg, Jerrold S., Dintiman,George., & Oakes Barbee Myers. (1995). *Physical fitness and Wellness*.
- Kangane, Sopan.,& Sonawane, Sanjeev. (2007). *Physical Education* (D. Ed.). Pune: Nirali publication.
- McCorthy, Aine. (1998). *How to lose weight & keep it* .Chennai: Joice publishing house.
- Rajeswari. (1999).*Weight Loss* Delhi: Pustak Mahal.
- Reema Kirtani. (2003). *Physical fitness for health*. New Delhi: Khel Sahitya Kendra.
- Sheokand, Daisy. (2007). *Physiology of physical fitness*. New Delhi: Sports publication.



- Singh, Ajmer. (2003). Essentials of physical Education. Ludhiana: Kalyani publishers.
- Uppal, A.K., & Gautam, G.P. (2004). Physical education and Health. Delhi: Friends Publisher.
- Vijayalakshmi.(2011). *Physical fitness*. New Delhi: Khel Sahitya Kendra.

**E-References:**

- [http://www.webhealthcentre.com/general/first\\_aid\\_index.asp](http://www.webhealthcentre.com/general/first_aid_index.asp)
- <http://www.livingposture.com/article.php?id=15>
- <http://www.stress-vacation.com/relaxation.htm>

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**SEMESTER – II**

**PSYCHOLOGICAL PERSPECTIVES OF LEARNERS**

**CODE:** 16CIED22

**Credits:** 3 (2L-0.5T-0.5P)

**Hours:** 4/Week

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

1. recognise higher mental process of concept formation, thinking, reasoning, problem solving and creativity.
2. familiarise with the theories and assessment of personality.
3. differentiate Mental health and Hygiene.
4. develop stress reduction strategies.
5. identify the role of teacher in guidance and counselling

**UNIT-I: Intelligence and Creativity**

Development of mental abilities: sensation, perception, memory, imagination, reasoning – Concept formation - Thinking process: role of language, images and imagination - Reasoning and problem solving.

Intelligence: definition and nature - Theories : monarchic, multi factor, two factor, group factor theory, Guilford's structure of intellect, multiple intelligence (Gardner) - Intelligence tests – their uses and abuses - Creativity and intelligence – identification and promotion of creativity – concept of Emotional intelligence and meta cognition.

**UNIT-II: Personality**

Meaning and concept – Determinants of Personality, Theories of Personality: Type approaches : Sheldon, Kretschmer, Jung, Hippocrates – Trait approaches : Allport, Cattell – Type cum Trait approach : Eysenck - Psycho-analytic approach: Sigmund Freud – Individual approach : Alfred Adler - Factors influencing Personality – Assessment of Personality – Integrated Personality.

**UNIT-III: Mental Health and Hygiene**

Concept of mental health and hygiene – conflicts, tensions and frustration – Reasons for Conflict: dilemmas, competition, perceived injustice, imperceptions of action or goals – adjustment – Defense mechanism – Stress – Stress coping/ reduction strategies – individual peace contributing to social cohesion. Effects of Stress on mental and physical health - Students problems – Unrest- Teacher as Counsellor.

**COURSE OUTCOME**

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

- CO1: Examine the development of mental abilities
- CO2: Differentiate mental health and hygiene
- CO3: Appraise stress reduction strategies
- CO4: Formulate the role of teacher in guidance and counseling

CO5: Identify the role of teacher in guidance and counselling

**References:**

- Aggarwal, J.C. (2008). Essentials of Educational Psychology, Vikas Publishing House (P) Ltd, New Delhi.
- Alla Appa Rao. (2010). Learning Disabilities, Neelkamal Publication (P) Ltd, New Delhi.
- Aruna Mohan, Y. (2009). Educational Psychology, Neelkamal Publication (P) Ltd, New Delhi.
- Baron, Robert A. (2011). Psychology, Darling Kinderssly (P) Ltd, New Delhi.
- Bharathi, T. (2008). Personality Development, Neelkamal Publications Pvt Ltd, New Delhi.
- Crow, L.D. (2008). Adjustment, Surjeet Publications, Delhi.
- Kenra, Asha K. (2008). Guidance & Counselling, Darling Kinderssly India Ltd, New Delhi.
- Kirunba Charles. (2011). Guidance & Counselling, Neelkamal Publication, Delhi.
- Kuppuswamy, B. (2008). Advanced Educational Psychology, Sterling Publishers, New Delhi.
- Safaya, R.N. (2007). Modern Educational Psychology, Dhanpat Publishers Company, New Delhi.
- Sangupta, Manjaree. (2010). Educational Psychology, New Central Book Agency (P) Ltd, Delhi.
- Santrock, John W. (2007). Child Development, Tata Mc Graw Hill, New Delhi, 2007.
- Skinner, Charles E. (2008). Educational Psychology, Surjeet Publications, Delhi.
- Vishala, Sis. Mary. (2009). Guidance and Counselling, S.Chand & Company Ltd, New Delhi.

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**SEMESTER-II**  
**MATHEMATICS – PAPER-2**  
**DIFFERENTIAL CALCULUS**

**CODE:** 16EIED22

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

**Objectives: To enable students to**

1. learn the principle and concepts of Differential Calculus
2. acquire the working knowledge in this course
3. apply the concepts to other courses

**Unit-I:** Successive Differentiation-  $n^{\text{th}}$  derivative, standard results – Leibnitz Theorem (without Proof) and its applications.

Book 1 Chapter 3 Section 1.1 -1.6 & Section 2.1 -2.2

**Unit-II:** Jacobians – Maxima and minima of functions of two independent variables. Necessary and Sufficient conditions (without proof) – Lagranges method of undetermined multipliers (without proof).

Book 1 Chapter 8 Section 4, 4.1, 5

Book 2 Chapter 3 Section 3

**Unit-III:** Envelopes- Curvature – Circle , radius and centre of curvature, Cartesian formula for the radius of curvature.

Book 1 Chapter 10 Section 1.1, 1.2, 1.3, 2.1-2.3

**Unit-IV:** Co-ordinates of the centre of curvature – Curvature- radius of curvature in polar Co-ordinates, p-r equations, Pedal equation of a curve.

Book 1 Chapter 10 Section 2.4, 2.6 - 2.8

**Unit-V:** Definition–Asymptotes parallel to the axis, oblique asymptotes,  $F_n + P_{n-2} = 0$  form Intersection of a curve with its asymptotes (proofs are not needed).

Book 1 Chapter 11 Section 1 - 4 & Sections 6 - 7

**COURSE OUTCOME**

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

CO1: Explain maxima and minima, critical points, and inflection points of functions and to determine the concepts of the curves.

CO2: Find the  $n^{\text{th}}$  derivative and standard result.

CO3: Solve the radius of the curvature of the problems using successive differentiation.

CO4: Find evolutes and envelope for the Cartesian and polar coordinate and curvature of pedal equations.

CO5: Solve the asymptotes for rational algebraic curves with special cases.

**Reference Books:**

1. S. Narayanan & T.K. Manickavachagom Pillay, Calculus Volume I (2004) ,  
S. Viswanathan Printers & Publishers
2. P.R. Vittal (2004) , Calculus , Margham Publications  
(P.T.O)
3. Singaravelu, R. Ramaa, Calculus & co-ordinate geometry of 2 dimensions (Paper II),  
Meenakshi Agency, Chennai

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**SEMESTER II****MATHEMATICS – PAPER-3****CLASSICAL ALGEBRA****CODE:** 16EIED23**Credits: 3 (2L: 1T: 0P)****Hours: 4/Week****Objectives: To enable students to**

- learn topics like Matrices
- learn the basic concepts in theory of numbers
- learn the concepts of theory of equations

**UNIT I:** Summation of series using Binomial, Exponential, Logarithmic series, and Approximation problems (only under Binomial Series)

**UNIT II:** Matrices, Symmetric – Skew- symmetric- Hermitian, Skew-Hermitian, Orthogonal and Unitary matrices, Cayley- Hamilton theorem (without proof) Eigen Values and Eigen vectors – Similar matrices – Diagonalisation

**UNIT III:** Theory of equations : Roots of an equation – Relation between the roots and coefficients – Transformations of equations – Descarte’s rule os signs- symmetric function of roots – Reciprocal equations.

**UNIT IV:** Multiple roots – Rolle’s theorem- position of real roots of  $f(x) = 0$  – Newton’s method of approximation to a root – Horner’s method.

**UNIT V:** Theory of numbers, prime numbers, composite numbers, decomposition into prime factors (without proof), Divisors of a positive integer ‘n’, Euler function  $\phi(n)$ , Formula for  $\phi(n)$  (without proof), the higher power of a prime contained in  $n!$ , Congruence’s, Fermat’s and Wilson’s theorem (without proof)- simple proof (**18 hrs**)

**COURSE OUTCOME**

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

CO1: Understand the summation of series

CO2: Explain the nature of the roots and symmetric property of roots in the  $n^{\text{th}}$  degree polynomial

CO3: Relate the coefficients and roots of the equation

CO4: Prove the concepts and theory of equations

CO5: Analyze the theory of numbers

**Reference Books:**

1. T.K. Manicavachagam Pillay, T.Natarajan, K.S.Ganapathy, Algebra Volume – I & II, S.Viswanathan Pvt. Ltd,2008
2. P.R. Vittal and V.Malini, Algebra and Trigonometry,Margam Publishers
3. A.Singaravelu and R.Ramaa, Algebra and Trognometry Vol I &II, Meenakshi Publications, Chennai.

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**SEMESTER-II****PHYSICS – PAPER-2****ACOUSTICS, THERMAL & STATISTICAL PHYSICS****CODE:** 16EIED21**Credits:** 4 (3L: 0T: 1P)**Hours:** 5/Week**Objectives : Enable the Students to**

1. study the relation between linearBD and rotational motion.
2. understand the production and propagation of waves in elastic media.
3. study the nature and transmission of heat and the laws associated with them.
4. study the laws of thermodynamics and understand their applications.
5. acquire knowledge of Maxwell's thermo dynamical relations and their importance.
6. understand the concepts of statistical thermodynamics and its applications.

**Unit-I: Sound**

Wave motion - characteristics of wave motion - transverse, longitudinal wave motion - Newton's formula for velocity of sound - effect of temperature, pressure, density of the medium, humidity and wind - stationary waves - Helmholtz resonator, theory of resonator, vibrations in rods - Kundt's tube - Doppler effect -applications, Acoustics of buildings - Reverberation – Sabine formula for reverberation - Ultrasonics - production and detection of ultrasonic waves - applications of ultrasonic waves.

**Unit-II: Transmission of Heat**

Coefficient of thermal conductivity- rectilinear flow of heat along a bar - Forbes method - Lee's method for bad conductors and liquids – convection and its applications - Black body - Stefan Boltzmann law - Wien's displacement law - Rayleigh - Jeans law - derivation and experimental verification of Stefan's law - Newton's law of cooling from Stefen's law - solar constant - temperature of the Sun - Angstrom's Pyroheliometer.

**Unit-III: Thermodynamics I**

Thermodynamic system - zeroth law of thermodynamics - internal energy - First law of thermodynamics - reversible and irreversible process - Carnot's ideal heat engine - Carnot's cycle - internal combustion engine - Otto and diesel engine - second law of

thermodynamics - entropy - change in entropy during reversible and irreversible process - entropy and second law of thermodynamics - third law of thermodynamics

#### **Unit-IV: Thermodynamics II**

Thermodynamic variable - Statistical equilibrium - Maxwell's thermodynamic relations - applications - Joule Thomson cooling - temperature of inversion - Clausius Claperon's latent heat equation - thermodynamic potential - T.dS equation - Joule Thomson porous plug experiment - Joule Thomson expansion - liquefaction of gases - liquefaction of hydrogen and Helium - adiabatic demagnetization - refrigerator.

#### **Unit-V: Statistical Thermodynamics**

Statistical equilibrium - probability theorems in statistical thermodynamics - Maxwell Boltzmann distribution law - Maxwell - Boltzmann distribution in terms of temperature - ideal gas - quantum statistics - Phase space – FD distribution law - application to electron gas - BE distribution law – application to photon gas - radiation laws - comparison of the three statistics.

### **COURSE OUTCOME**

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

CO1: Understand different concepts in acoustics and apply it in building acoustics.

CO2: Apply the concepts of Liquefaction of gases in the low temperature and its practical applications.

CO3: Analyze the laws of thermodynamics and understand their applications.

CO4: Examine the Maxwell's thermo dynamical relations and their importance.

CO5: Develop the design and fabrication of various Heat engines and improve its efficiency.

### **References Books:**

1. Fundamentals of Physics, 6th Edition, David Halliday, Robert Resnick and Jay Walker, John Wiley and Sons, Inc.
2. University Physics, Revised Edition, Harris Benson, John Wiley and Sons Inc.
3. Heat and Thermodynamics, Zeemansky, McGraw Hill.
4. Physics of Vibration and Waves, H J Pain.
5. N. Subrahmanyam and Brijlal, Sound, Vikas publication House, 1994.
6. Brijlal and Subramanyam, Heat and thermodynamics, S.Chand and Co.,2007.

### **Physics Practicals – II**

#### **Paper – II**

#### **Any Seven Practicals**

1. Spectrometer – dispersive power of prism.



2. Air wedge.
3. Newton's ring.
4. Careyfosters Bridge – R & r.
5. Potentiometer – Low range voltmeter.
6. Potentiometer – Internal resistance.
7. Young's modulus – Cantilever/ stretching.
8. Post office box- temperature co-efficient.
9. M1/M2- Vibration magnetometer.

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**SEMESTER-II**  
**CHEMISTRY – PAPER-II**  
**METALLURGY AND CHEMISTRY OF NON-METALS**

**Code:****Credits: 4 (3L: 0T: 1P)****Hours: 5/Week**

**Course objective:** To learn about the periodic table classification, properties and comparative studies

**Unit-I – Chemistry of `d` block elements**

Characteristics of `d` block elements. Comparative study of Ti, V, Cr, Mn and Iron group metals- occurrence, oxidation states, magnetic properties, catalytic properties and color.

**Unit II – Metallurgy**

General principles of metallurgy –occurrence- concentration of the ores- extraction of the metals Extraction of following metals: Al, Ca, Ti, Cr, Mn, Ni, V, Sn and Pb.

**Unit-III – Chemistry of P block elements**

Carbon family - Comparison of properties of carbon and silicon valencies, oxides, halides, hydrides and oxyacids classification, properties and uses of carbides. Classification of silicates.

**Unit-IV – Nitrogen and Oxygen family**

Comparative study of N, P, As, Sb, and Bi – elements, oxides, oxyacids, halides and anhydrides, valency states – preparation, properties, structure and uses of hydrazine, hydroxylamine and hydrazoic acids, preparation and uses of  $\text{NaBiO}_3$ .

Comparative study of O, S, Se, and Te - elements, hydrides, oxides and oxyacids of sulphur including peroxy acids.

**Unit-V – Halogens and Nobel Gases**

Comparative study of F, Cl, Br, I and At – elements reactivities, hydrogen halides, oxides and oxyacids. Interhalogen compounds and pseudo halogens. Exceptional properties of Fluorine. Electronic onfiguration and position in the periodic table. Applications, clathrates and compounds of xenon, hybridization and geometries of  $\text{XeF}_2$ ,  $\text{XeF}_4$ ,  $\text{XeOF}_4$ .

**Text Books:**

- P. L. Soni, “Text Book of Inorganic Chemistry” Sultan Chand & sons. 32<sup>nd</sup> edition. 2013.
- R. D. Madhan, “Modern Inorganic Chemistry” S. Chand & Co., 6<sup>th</sup> edition 2012

**COURSE OUTCOME**

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

- CO1: Gain the knowledge about the Characteristics of 'd' block elements
- CO2: comparative study of Ti, V, Cr, Mn and Iron group metals
- CO3: Analyze the general principles of metallurgy, occurrence, and concentration of the ores
- CO4: Apply the theories in extraction of the selected metals.
- CO5: Examine the characteristics Halogens and Nobel Gases.

**Reference Books:**

- James E. Huheey, Ellen, A. Keiter, Richard, L. Keiter, "Inorganic Chemistry" Pearson education (Singapore Pvt Limited) 9<sup>th</sup> edition, **2013**
- J. D.Lee, Concise Inorganic chemistry" Blackwell Science Limited (France) 9<sup>th</sup> edition **2013**

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**CHEMISTRY**  
**PRACTICAL-II**

**List of Experiments**

1. Reaction of simple radicals.
2. Reaction of Interfering acid radicals
3. Reactions of groups I, II and III cations.
4. Reactions of groups IV, V and VI cations
5. Elimination of interfering acid radicals
6. Analysis of salt mixture – I.
7. Analysis of salt mixture – II.
8. Analysis of salt mixture – III.

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