# VAGDEVI DEGREE COLLEGE

(Affiliated to Acharya Nagarjuna University)

(College Code : 116)

Ravipadu Road, Narasaraopet, Palnadu Dt, A.P., Ph : 9247025166


## Teaching Plan

**Name of the Course with code : LOW TEMPERATURE PHYSICS-6B**

**Class & Semester / Academic Year : B.SC/Vth SEM/2023-2024**

**Name of the faculty Member : K. RANJITHA**

| S. No | Topic | No. of periods required | Book(s) followed |
|---|---|---|---|
| | **UNIT - 1** | | |
| 1. | Production of low temperatures-Introduction | 4 | TB & RB |
| 2. | Freezing mixtures | 3 | TB & RB |
| 3. | Joule-Thomson effect | 3 | TB & RB |
| 4. | Regenerative cooling | 3 | TB & RB |
| 5. | Different methods of liquefaction of gases | 2 | TB & RB |
| 6. | Liquefaction of air | 1 | TB & RB |
| 7. | Production of liquid hydrogen and nitrogen | 1 | TB & RB |
| 8. | Adiabatic demagnetization | 3 | TB & RB |
| 9. | Properties of materials at low temperatures | 1 | TB & RB |
| 10. | Superconductivity | 1 | TB & RB |
| | **Total no. of periods required** | **22** | |
| | **UNIT - 2** | | |
| 1. | Gas thermometer and its correction and calibration | 2 | TB & RB |
| 2. | Secondary thermometers, resistance thermometers | 1 | TB & RB |
| 3. | Thermocouples | 1 | TB & RB |
| 4. | Vapour pressure thermometers | 1 | TB & RB |
| 5. | Magnetic thermometers, Advantages and drawbacks of each type of thermometer | 3 | TB & RB |
| | **Total no. of periods required** | **08** | |
| | **UNIT - 3** | | |
| 1. | Introduction to Refrigeration- Natural and artificial refrigeration | 1 | TB & RB |
| 2. | Stages of refrigeration, Types of refrigeration - Vapor compression refrigeration system | 1 | TB & RB |
| 3. | Vapor absorption refrigeration systems | 1 | TB & RB |
| 4. | Refrigeration cycle and explanation with a block diagram | **1** | TB & RB |
| 5. | Introductory ideas on air conditioning. Refrigerants-introduction, Ideal refrigerant | 1 | TB & RB |
| 6. | Properties of refrigerant | 1 | TB & RB |

| | | | |
|---|---|---|---|
| 7. | Classification of refrigerants | 1 | TB & RB |
| 8. | Commonly used refrigerants, Eco-friendly refrigerants | 1 | TB & RB |
| | **Total no. of periods required** | **08** | |
| | Unit -4 | | |
| 1. | Refrigerator and its working, Block diagram | 1 | TB & RB |
| 2. | Coefficient of Performance (COP), Tons of refrigeration (TR) and Energy Efficiency Ratio (EER) | 1 | TB & RB |
| 3. | Refrigerator components: Types of compressors | 1 | TB & RB |
| 4. | Evaporators | **1** | TB & RB |
| 5. | Condensers | 3 | TB & RB |
| 6. | Defrosting in a refrigerator | 1 | TB & RB |
| 7. | Refrigerant leakage and detection | 1 | TB & RB |
| | **Total no. of periods required** | **09** | |
| | **Unit - 5** | | |
| 1. | Applications of flow temperatures: Preservation of biological material | 2 | TB & RB |
| 2. | Food freezing, liquid nitrogen and liquid hydrogen in medical field | 1 | TB & RB |
| 3. | Superconducting magnets in MRI- Tissue ablation (cryosurgery) | 2 | TB & RB |
| 4. | Cryogenic rocket propulsion system | 1 | TB & RB |
| 5. | Applications of refrigeration: Domestic refrigerators | 1 | TB & RB |
| 6. | Water coolers, Cold storages | 2 | TB & RB |
| 7. | Ice plants, Food preservation methods | 2 | TB & RB |
| 8. | Chemical and Process industries | 1 | TB & RB |
| 9. | Cold treatment of metals | **2** | TB & RB |
| 10. | Construction field, Desalination of water, Data centers | 1 | TB & RB |
| | **Total no. of periods required** | **15** | |
| | **Grand total no. of periods required** | **62** | |

**Text books:**

- The physics hyper text book
- Low-Temperature Physics by Christian E. & Siegfried H., Springer

**Reference books**:

- Heat and Thermodynamics by Brij Lal &N.Subramanyam, S.Chand Publishers

**Faculty** **Head of the Department**

VAGDEVI DEGREE COLLEGE
(Affiliated to Acharya Nagarjuna University)
(College Code : 116)
Ravipadu Road, Narasaraopet, Palnadu Dt, A.P., Ph : 9247025166

# Teaching Plan

**Name of the Course with code** : **ADVANCES IN MATHEMATICAL,PHYSICAL&CHEMICAL SCIENCES**

**Class & Semester / Academic Year :** B Sc/1st SEM/2023-2024

**Name of the faculty Member** : M.SRINIVASARAO
SAILESH
DAVID RAJU
RANJITHA

| S. No | Topic | No. of periods required | Book(s) followed |
|---|---|---|---|
| | **UNIT 1** | | |
| 1 | Straight Lines: Different forms – Reduction of general equation into various forms | 3 | TB & RB |
| 2 | Point of intersection of two straight lines | 3 | TB & RB |
| 3 | Limits and Differentiation: Standard limits | 3 | TB & RB |
| 4 | Derivative of a function | 3 | TB & RB |
| 5 | Problems on product rule and quotient rule | 3 | TB & RB |
| 6 | Integration: Integration as a reverse process of differentiation – Basic methods of integration | 3 | TB & RB |
| 7 | Matrices: Types of matrices – Scalar multiple of a matrix | 3 | TB & RB |
| 8 | Multiplication of matrices | 1 | TB & RB |
| 9 | Transpose of a matrix and determinants | 1 | TB & RB |
| | **Total no. of periods required** | 23 | |
| | **UNIT 2** | | |
| 1 | Renewable energy: Generation | 3 | TB & RB |
| 2 | energy storage | 3 | TB & RB |
| 3 | energy-efficient materials and devices | 3 | TB & RB |
| 4 | Recent advances in the field of nanotechnology: Quantum dots | 3 | TB & RB |
| 5 | Quantum Communication | 3 | TB & RB |

| | | | |
|---|---|---|---|
| 6 | recent advances in biophysics | 3 | TB & RB |
| 7 | recent advances in medical physics | 3 | TB & RB |
| 8 | Shape Memory Materials | 2 | TB & RB |
| | **Total no. of periods required** | 23 | |
| UNIT 3 | | | |
| 1 | Computer aided drug design and delivery | 3 | TB & RB |
| 2 | nano sensors | 3 | TB & RB |
| 3 | Chemical Biology | 3 | TB & RB |
| 4 | impact of chemical pollutants on ecosystems and human health | 3 | TB & RB |
| 5 | Dye removal - Catalysis method | 3 | TB & RB |
| | **Total no. of periods required** | 15 | |
| UNIT 4 | | | |
| 1 | Mathematical Modelling applications in physics and chemistry Application of Renewable energy: Grid Integration and Smart Grids | 1 | TB & RB |
| 2 | Application of nanotechnology: Nanomedicine | 1 | TB & RB |
| 3 | Application of biophysics: Biophysical Imaging, | **2** | TB & RB |
| 4 | Biomechanics, Neurophysics | 2 | TB & RB |
| 5 | Application of medical physics: Radiation Therapy Nuclear medicine | 2 | TB & RB |
| 6 | Solid waste management | 1 | TB & RB |
| 7 | Environmental remediation | 1 | TB & RB |
| 8 | Green Technology ,Water treatment | 1 | TB & RB |
| | **Total no. of periods required** | 11 | |
| | | | |
| 1 | Number System-Binary, Octal, decimal, and Hexadecimal | 3 | TB & RB |
| 2 | Signals-Analog, Digital | 3 | TB & RB |
| 3 | Modem, Codec | 3 | TB & RB |
| 4 | Multiplexing | 3 | TB & RB |
| 5 | Transmission media | 3 | TB & RB |
| 6 | error detection and correction- Parity check and CRC | 3 | TB & RB |
| 7 | Networking devices- Repeater | 3 | TB & RB |
| 8 | hub, bridge, switch, router, gateway | 2 | TB & RB |
| | **Total no. of periods required** | 23 | |
| | **Grand Total no. of periods required** | 34 | |

**Text books:**

- Coordinate Geometry by S.L.Lony, Arihant Publications
- Environmental Chemistry by Anil.K.D.E
- Data Communication & Networking by Bahrouz Forouzan

**Reference books:**

- "Nanotechnology: Principles and Applications" by Sulabha K. Kulkarni and Raghvendra A. Bohara
- Nano materials and applications by M.N.Borah
- Digital Logic Design by Morris Mano

**FACULTY SIGNATURE** **HEAD OF THE DEPARTMENT**

# VAGDEVI DEGREE COLLEGE

(Affiliated to Acharya Nagarjuna University)

(College Code : 116)

Ravipadu Road, Narasaraopet, Palnadu Dt, A.P., Ph : 9247025166


## Teaching Plan

**Name of the Course with code** : **ESSENTIALS AND APPLICATIONS OF MATHEMATICAL,PHYSICAL&CHEMICAL SCIENCES**

**Class & Semester / Academic Year :** 1 BSC/2023-2024

**Name of the faculty Member** : M.SRINIVASARAO, SAILESH ,DAVID RAJU , RANJITHA

| S.No | Topic | No. of periods required | Book(s) followed |
|---|---|---|---|
| | **UNIT 1** | | |
| 1. | Complex Numbers: Introduction of the new symbol | 3 | TB & RB |
| 2. | General form of a complex number | 3 | TB & RB |
| 3. | Modulus- Amplitude form and conversions | 3 | TB & RB |
| 4. | Trigonometric Ratios: Trigonometric Ratios and their relations | 3 | TB & RB |
| 5. | Problems on calculation of angles | 3 | TB & RB |
| 6. | Vectors: Definition of vector addition | 3 | TB & RB |
| 7. | Cartesian form | 3 | TB & RB |
| 8. | Scalar and vector product and problems | 3 | TB & RB |
| 9. | Statistical Measures: Mean, Median, Mode of a data and problems | 3 | TB & RB |
| | **Total no .of periods** | **27** | |
| | **UNIT 2** | | |
| 1. | Definition and Scope of Physics- Measurements and Units | 3 | TB & RB |
| 2. | Motion of objects: Newtonian Mechanics and relativistic mechanics perspective | 3 | TB & RB |
| 3. | Laws of Thermodynamics and Significance | 3 | TB & RB |
| 4. | Acoustic waves and electromagnetic waves | 3 | TB & RB |
| 5. | Electric and Magnetic fields and their interactions | 3 | TB & RB |
| 6. | Behaviour of atomic and nuclear particles | 3 | TB & RB |
| 7. | Wave-particle duality | 2 | TB & RB |
| 8. | the uncertainty principle | 2 | TB & RB |
| 9. | Theories and understanding of universe | 1 | TB & RB |
| | **Total no .of periods** | 23 | |
| | UNIT 3 | | |
| 1. | Definition and Scope of Chemistry | 3 | TB & RB |

| | | | |
|---|---|---|---|
| 2. | Importance of Chemistry in daily life -Branches of chemistry and significance | 3 | TB & RB |
| 3. | Periodic Table | 3 | TB & RB |
| 4. | Electronic Configuration | 3 | TB & RB |
| 5. | chemical changes | 3 | TB & RB |
| 6. | classification of matter | 3 | TB & RB |
| 7. | Biomolecules- carbohydrates | 3 | TB & RB |
| 8. | proteins, fats | 3 | TB & RB |
| 9. | vitamins. | 3 | TB & RB |
| | **Total no .of periods** | 27 | |
| **UNIT 4** | | | |
| 1. | Applications of Mathematics in Physics & Chemistry: Calculus , Differential Equations & Complex Analysis | 3 | TB & RB |
| 2. | Application of Physics in Industry and Technology: Electronics and Semiconductor Industry | 3 | TB & RB |
| 3. | Robotics and Automation | 3 | TB & RB |
| 4. | Automotive and Aerospace Industries | 3 | TB & RB |
| 5. | Quality Control and Instrumentation, | 2 | TB & RB |
| 6. | Environmental Monitoring and Sustainable Technologies | 1 | TB & RB |
| | **Total no .of periods** | 15 | |
| **UNIT 5** | | | |
| 1. | Milestones of computer evolution - Internet, history | 3 | TB & RB |
| 2. | Internet Service Providers | 3 | TB & RB |
| 3. | Types of Networks | 3 | TB & RB |
| 4. | IP, Domain Name Services, applications. | 3 | TB & RB |
| 5. | Ethical and social implications: Network and security concepts- Information Assurance Fundamentals | 3 | TB & RB |
| 6. | Cryptography-Symmetric and Asymmetric | 3 | TB & RB |
| 7. | Malware | 3 | TB & RB |
| 8. | Firewalls | 3 | TB & RB |
| 9. | Fraud Techniques- Privacy and Data Protection | 3 | TB & RB |
| | **Total no. of periods** | 27 | |
| | **Grand total no. of periods** | 38 | |

**Text books:**

- Chemistry of bio molecules by S. P. Bhutan
- Physics for Technology and Engineering" by John Bird
- Elementary Trigonometry by H.S.Hall and S.R.Knight
- Cyber Security Essentials by James Graham, Richard Howard, Ryan Olson

## Reference books:

- Vector Algebra by A.R.Vasishtha
- University Physics with Modern Physics by Hugh D. Young and Roger A. Freedman

**FACULTY SIGNATURE** **HEAD OF THE DEPARTMENT**

# VAGDEVI DEGREE COLLEGE

(Affiliated to Acharya Nagarjuna University)

(College Code : 116)

Ravipadu Road, Narasaraopet, Palnadu Dt, A.P., Ph : 9247025166


## Teaching Plan

**Name of the Course with code : PRINCIPLES OF PHYSICAL SCIENCES**

**Class & Semester / Academic Year : BCA/1ST SEM/2023-2024**

**Name of the faculty Member : K RANJITHA**

| S. No | Topic | No. of periods required | Book(s) followed |
|---|---|---|---|
| | **UNIT - 1** | | |
| 1. | Nature of Physics: Overview of physics as a discipline, | 1 | TB & RB |
| 2. | Scope of physics | 1 | TB & RB |
| 3. | Physics relationship to other sciences | 1 | TB & RB |
| 4. | Scientific Method in Physics: Introduction to the scientific method | 1 | TB & RB |
| 5. | Measurement and Units: Understanding the principles of measurement | 1 | TB & RB |
| 6. | SI units, | 1 | TB & RB |
| 7. | Importance of accurate and precise measurements. | 1 | TB & RB |
| 8. | Scalars and Vectors: Differentiating between scalars and vectors, | 1 | TB & RB |
| 9. | Understanding vector addition and subtraction. | 1 | TB & RB |
| | Total no. of periods required | 09 | |
| | UNIT - 2 | | |
| 1. | Motion and Forces: Introduction to the principles of motion, including velocity, acceleration, and the laws of motion | 1 | TB & RB |
| 2. | Energy and Work: Understanding the concept of energy | 1 | TB & RB |
| 3. | Different forms of energy, | 1 | TB & RB |
| 4. | The relationship between work and energy | 1 | TB & RB |
| 5. | Circular Motion: Exploring the principles of circular motion | 1 | TB & RB |
| 6. | Centripetal force, and applications in real-world scenarios. | 1 | TB & RB |
| 7. | Gravity: Introduction to the concept of gravity | 1 | TB & RB |
| 8. | Newton's law of universal gravitation, and its | 1 | TB & RB |

| | | | |
|---|---|---|---|
| | implications | | |
| | Total no. of periods required | 08 | |
| Unit - 3 | | | |
| 1. | Waves: Understanding the properties and characteristics of waves, | **1** | TB & RB |
| 2. | Wave types, wave motion, and wave interference | 1 | TB & RB |
| 3. | Exploring the nature of sound waves | 1 | TB & RB |
| 4. | Properties of sound, sound propagation, and the Doppler effect | 1 | TB & RB |
| 5. | Light and Optics: Introduction to the behavior of light | 1 | TB & RB |
| 6. | Reflection, refraction | 1 | TB & RB |
| 7. | Formation of images by mirrors and lenses. | 1 | TB & RB |
| 8. | Wave Optics: Understanding the principles of interference, diffraction, and polarization of light waves | 1 | TB & RB |
| | Total no. of periods required | 08 | |
| | Grand total no. of periods required | 25 | |

**Text books:**

- "University Physics" by Hugh D. Young and Roger A. Freedman

**Reference books:**

- Physical Science" by Bill Tillery
- "Fundamentals of Physics" by Jearl Walker, David Halliday, and Robert Resnick

Faculty Signature Head of the department

VAGDEVI DEGREE COLLEGE
(Affiliated to Acharya Nagarjuna University)
(College Code : 116)
Ravipadu Road, Narasaraopet, Palnadu Dt, A.P., Ph : 9247025166

# Teaching Plan

**Name of the Course with code : PRINCIPLES OF PHYSICAL SCIENCES**

**Class & Semester / Academic Year : B. Com/1ST SEM/2023-2024**

**Name of the faculty Member : K RANJITHA**

| S. No | Topic | No. of periods required | Book(s) followed |
|---|---|---|---|
| | **UNIT - 1** | | |
| 1. | Nature of Physics: Overview of physics as a discipline, | 1 | TB & RB |
| 2. | Scope of physics | 1 | TB & RB |
| 3. | Physics relationship to other sciences | 1 | TB & RB |
| 4. | Scientific Method in Physics: Introduction to the scientific method | 1 | TB & RB |
| 5. | Measurement and Units: Understanding the principles of measurement | 1 | TB & RB |
| 6. | SI units, | 1 | TB & RB |
| 7. | Importance of accurate and precise measurements. | 1 | TB & RB |
| 8. | Scalars and Vectors: Differentiating between scalars and vectors, | 1 | TB & RB |
| 9. | Understanding vector addition and subtraction. | 1 | TB & RB |
| | Total no. of periods required | 09 | |
| | UNIT - 2 | | |
| 1. | Motion and Forces: Introduction to the principles of motion, including velocity, acceleration, and the laws of motion | 1 | TB & RB |
| 2. | Energy and Work: Understanding the concept of energy | 1 | TB & RB |
| 3. | Different forms of energy, | 1 | TB & RB |
| 4. | The relationship between work and energy | 1 | TB & RB |
| 5. | Circular Motion: Exploring the principles of circular motion | 1 | TB & RB |
| 6. | Centripetal force, and applications in real-world scenarios. | 1 | TB & RB |
| 7. | Gravity: Introduction to the concept of gravity | 1 | TB & RB |
| 8. | Newton's law of universal gravitation, and its | 1 | TB & RB |

| | | | |
|---|---|---|---|
| | implications | | |
| | Total no. of periods required | 08 | |
| Unit - 3 | | | |
| 1. | Waves: Understanding the properties and characteristics of waves, | **1** | TB & RB |
| 2. | Wave types, wave motion, and wave interference | 1 | TB & RB |
| 3. | Exploring the nature of sound waves | 1 | TB & RB |
| 4. | Properties of sound, sound propagation, and the Doppler effect | 1 | TB & RB |
| 5. | Light and Optics: Introduction to the behavior of light | 1 | TB & RB |
| 6. | Reflection, refraction | 1 | TB & RB |
| 7. | Formation of images by mirrors and lenses. | 1 | TB & RB |
| 8. | Wave Optics: Understanding the principles of interference, diffraction, and polarization of light waves | 1 | TB & RB |
| | Total no. of periods required | 08 | |
| | Grand total no. of periods required | 25 | |

## Text books:

- "University Physics" by Hugh D. Young and Roger A. Freedman

**Reference books:**

- Physical Science" by Bill Tillery
- "Fundamentals of Physics" by Jearl Walker, David Halliday, and Robert Resnick

Faculty Signature Head of the department