

## SYLLABUS – MSE2

### **1. HSMC-103 (PEEM) SECTION: CSA**

Unit 3, 4, 5, 7 & 8 of the Syllabus

### **2. HSMC-103 (PEEM) SECTIONS: CSB, CSC, CSD, CEA, CEB, EEA**

- (i) **Theory of Demand-** Consumer's Surplus
- (ii) **Theory of factor Pricing-** Marginal productivity theory, Modern theory of factor pricing.
- (iii) **Principles of management-** Henri Fayol's principles, F.W Taylor's principles.
- (iv) **Break even chart**
- (v) **Economic order quantity**

### **3. BSC-103 (MATH-I) SECTION: CSA**

Infinite Series, Linear Algebra

### **4. BSC-103 (MATH-I) SECTIONS: CSB, CSC, CSD, CEA, CEB, EEA**

Matrices, Infinite Series (p test, limit comparison test, ratio test)

### **5. BSC-101 (PHYSICS)**

**CSA and CEA** - 1. Electromagnetism (Maxwell equations and em wave equation)

2. Semiconductors

3. Physics of materials (Electric materials, electronic materials, Magnetic materials, Superconductivity, Nanotechnology)

**EEA** - SHM, Damped Oscillator, Dielectric materials, Ferroelectric substances, dia, para, ferromagnetic substances, magnetostriction, magnetic anisotropy, BH curve, ferrites and their applications, Type 1 and Type 2 superconductors, Meissner effect, London equations, types of nanomaterials, surface area to volume ratio, quantum confinement, numericals based on de-Broglie hypothesis.

**CSB, CSC, CSD, CEB** – Semiconductors, Quantum Mechanics (numericals based on de-Broglie hypothesis, wave packet formation, phase velocity, group velocity, dispersion relations, prove group velocity = particle velocity, time independent Schrodinger equation, particle in 1-D box)

### **6. BSC-104 (MATH-II) SECTIONS: MEA, MEB, ECA, ECB, ITA, ITB, ITC**

Multiple Integrals

### **7. BSC-105 (CHEMISTRY) SECTIONS: MEA, MEB, ECA, ECB, ITA, ITB, ITC**

Unit 1: Atomic and molecular structure

Unit 2: UV spectroscopy (Only Woodward Fieser Rule), IR spectroscopy and NMR

Unit 5: Use of free energy in chemical equilibria and phase equilibria

**8. ESC-104 (PPS): SECTIONS: ECB, ITA, ITB, ITC**

**UNIT -4** (Basic Algorithms), **UNIT- 5** (Functions), **UNIT-8** (Pointers)

**9. ESC-104 (PPS): SECTIONS: MEA, MEB, ECA**

UNITS 4, 5, 6, 7, 8.

**10. ESC-103 (EGD) SECTIONS: CSA, CSB, CSC, CSD, CEA, CEB, EEA**

1. Projections of Solids 2. Section of Solids 3. Development of Surfaces

**11. ESC-101 (BEE) SECTIONS: CSA, CSB, CSC, CSD, CEA, CEB, EEA**

**Module 3:** Transformers

Magnetic materials, BH characteristics, ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer connections.

**Module 4:** Electrical Machines

Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor. Single-phase induction motor. Construction, working, torque-speed characteristic and speed control of separately excited dc motor. Construction and working of synchronous generators.

**Module 5:** Electrical Installation

Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.

**12. HSMC-101 (ENGLISH) SECTIONS: MEA, MEB, ECA, ECB, ITA, ITB, ITC**

1) **READING SKILLS**

2) **BASIC WRITING SKILLS**

Sentence structures; Use of phrases and clauses in Sentence; Paragraph Writing and Essay Writing

3) **IDENTIFYING COMMON ERRORS IN WRITING**

Subject Verb Agreement

Noun Pronoun Agreement

Misplaced Modifiers

Articles and Prepositions