## HS-201N Fundamentals of Management

| Lecture | Tutorial | Practical | Major Test | Minor Test | Total Time |
|---|---|---|---|---|---|
| 3 | 1 | | 75 | 25 | 3H |

| |
|---|
| **Purpose To make the students conversant with the basics concepts in management thereby leading to nurturing their managerial skills** |
| **COURSE OUTCOMES** |
| **CO1** An overview about management as a discipline and its evolution |
| **CO2** Understand the concept and importance of planning and organizing in an organization |
| **CO3** Enabling the students to know about the importance of hiring and guiding the workforce by understanding the concept of leadership and communication in detail |
| **CO4** To understand the concept and techniques of controlling and new trends in management |

### UNIT-1

**Introduction to Management:** Meaning, Definition, nature, importance & Functions, Management as Art, Science & Profession-Management as social System, Concepts of management-Administration

**Evolution of Management Thought**: Development of Management Thought-Scientific management, Administrative Theory of Management, Bureaucratic Organization, Behavioral approach (Neo Classical Theory): Human Relations Movement; Behavioral Science approach; Modern approach to management –Systems approach and contingency approach.

### UNIT-II

**Planning**: nature, purpose and functions, types of plans, planning process, Strategies and Policies:Concept of Corporate Strategy, formulation of strategy, Types of strategies, Management by objectives (MBO), SWOT analysis, Types of policies, principles of formulation of policies

**Organizing:** nature, importance, process, organization structure: Line and Staff organization, Delegation of Authority and responsibility, Centralization and Decentralization, Decision Making Process , Decision Making Models, Departmentalization: Concept and Types (Project and Matrix),formal & informal organizations

### UNIT-III

**Staffing:** concept, process, features; manpower planning; Job Analysis: concept and process; Recruitment and selection: concept, process, sources of recruitment; performance appraisal, training and development Directing: Communication-nature, process, formal and informal, barriers to Effective Communication, Theories of motivation-Maslow, Herzberg, McGregor ; Leadership–concept and theories, Managerial Grid, Situational Leadership. Transactional and Transformational Leadership

### UNIT-IV

**Controlling**: concept, process, types, barriers to controlling, controlling Techniques: budgetary control, Return on investment, Management information system-MIS , TQM-Total Quality Management, Network Analysis-PERT and CPM. Recent Trends in Management:-Social Responsibility of Corporate Social Responsibility (CSR) and business ethics. Functional aspects of business: Conceptual framework of functional areas of management-Finance; Marketing and Human Resources

**Text books**

1.Management Concepts -Robbins, S.P; Pearson Education India
2.Principles of Management -Koontz &O'Donnel; (McGraw Hill)

**Recommended books**

1.Business Organization and Management –Basu ; Tata McGraw Hill
2.Management and OB--Mullins; Pearson Education
3.Essentials of Management –Koontz, Tata McGraw-Hill
4.Management Theory and Practice –Gupta, C.B; Sultan Chand and Sons, new Delhi
5.Prasad, Lallan and S.S. Gulshan. Management Principles and Practices. S. Chand & Co. Ltd., New Delhi.
6.Chhabra, T.N. Principles and Practice of Management. DhanpatRai& Co., Delhi.
7.Organizational behavior –Robins Stephen P; PHI.

**NOTE:** Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

| CHE - 202N | HEAT TRANSFER | | | | | |
|---|---|---|---|---|---|---|
| Lecture | Tutorial | Practical | Theory | Sessional | Total | Time |
| 4 | 1 | - | 75 | 25 | 100 | 3 |
| Purpose | To understand the basic concept and applications of various modes of heat transfer, boiling & condensation, Evaporation and types of Heat exchangers. | | | | | |
| Course Outcomes | | | | | | |
| CO1 | To understand the concept of basic equations of steady state condition in slab, cylinder and sphere, Critical thickness of insulation, Use of transient temperature charts and lumped system analysis. | | | | | |
| CO2 | To understand the basic concept of convection, boiling & condensation | | | | | |
| CO3 | To familiarize with the concept of various types of Heat exchangers. | | | | | |
| CO4 | To familiarize with the concept of Radiation and Evaporations. | | | | | |

**Paper Setter's Note:** 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

## UNIT I

**Introduction:**Basis equation - one dimensional, two dimensional and three dimensional, Steady state condition in slab, cylinder and sphere, Critical thickness of insulation. Finned surfaces, Transient conduction Analytical solution for slabes, Use of transient temperature charts for slabs, cylinders and sphere and lumped system analysis.

## UNIT II

**Convection:**Concept of free and forced convection. Dimensional Analysis.Empirical correlations for free and forced convection for various shapes.

**Boiling & Condensation:**Filmwise and dropwise condensation, Laminar film condensation on a vertical plate, Film condensation on tubes, Boiling regimes, Bubble growth and nucleate boiling.

## UNIT III

**Heat Exchangers:**Basic types of heat exchanges, Overall heat transfer coefficient, log mean temperature difference, Effectiveness and NTU methods for heat exchanger analysis.

## UNIT IV

**Radiation:**Black body radiation, radiation properties, concept of shape factor, Radiation exchange in enclosure with black surface.

**Evaporators:** Types of evaporators, Single & Multiple effect evaporators, calculationsfor surface area requirement. Methods of feeding.

**Books Recommended:**

1. W. L. McCabe & J. C. Smith, Unit operations of chemical engineering, McGraw Hill Book Company, New Delhi
2. J. P. Holman, Heat Transfer, McGraw Hill Book Company, New Delhi.
3. M. L. Oziski, Heat Transfer, McGraw Hill International Editions.
4. A. J. Chapman, Heat, Macmillan Indian, Delhi.
5. D. S. Kumar, Heat and Mass Transfer, S.K. Kataria and Sons, Delhi. .
6. Kirk, D. Hegen, Heat Transfer with Applications, Prentice Hall International. Inc., New Jercy.

| CHE-204N | CHEMICAL TECHNOLOGY-I | | | | | |
|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Theory** | **Sessional** | **Total** | **Time** |
| 3 | 0 | - | 75 | 25 | 100 | 3 |
| **Purpose** | To provide the knowledge and information about the chemical industries involving process technology, availability of raw materials, preparation of flow sheet and material of construction. | | | | | |
| **Course Outcomes** | | | | | | |
| **CO1** | To familiarize about the Industrial and Fuel Gases, possible impurities, and water treatment methods. | | | | | |
| **CO2** | To familiarize about the manufacturing of various fertilizers. | | | | | |
| **CO3** | To understand the various manufacturing processes of Chlor alkali and Chlor alkali industry. | | | | | |
| **CO4** | To familiarize with the manufacturing of Sulphur and Ceramics. | | | | | |

**Paper Setter's Note:** 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

## UNIT I

**Industrial and Fuel Gases**: Oxygen, nitrogen, hydrogen, natural gas, water gas, coal gas, carburetted Water gas: Sources and constraints, dissolved impurities, suspended impurities, colloidal impurities, hardness of water, water softening, ion exchange, Zeolite-processes.

## UNIT II

**Fertilizer industry:** Ammonia, nitric acid, ammonium sulfate, ammonium nitrate, urea, NPK, phosphorus, phosphoric acid, phosphatic fertilizers, diammoniumphosphate.

## UNIT III

**Chlor-alkali industry:**Solvey and modified solvey process, Brine Electrolysis manufacture of caustic soda and chlorine, diaphragm cells, membrane cells, mercury cell, hydrochloric acid.

## UNIT IV

**SulphurandCeramics:**Sulphur dioxide, sulphuric acid, oleum, cement, glassand refractories.

**Books Recommended:**

1. C.E. Dryden, Outline of Chemical Technology: East- West Press Pvt Ltd., New Delhi.
2. G. T. Austin, Shreve's Chemical Process Industries, McGraw Hill Book Company, New Delhi.
3. Chemical Engineering Education Development centre- "Chemical Technology I, II, III, IV, Mannual of Chemical Technology, Indian Institute of Technology, Madras".
4. S. D. Shukla and G. N. Pandey, A text book of Chemical Technology Vol I, Vikas Publishing House Pvt.Ltd., New Delhi.
5. S. D. Shukla and G. N. Pandey, A text book of Chemical Technology Vol. II, Vikas Publishing House Pvt.Ltd., New Delhi.

| CHE - 206N | MECHANICAL OPERATIONS | | | | | |
|---|---|---|---|---|---|---|
| Lecture | Tutorial | Practical | Theory | Sessional | Total | Time |
| 4 | 1 | - | 75 | 25 | 100 | 3 |
| Purpose | To understand the concept of unit operation and their role in chemical engineering industries, Types of mechanical operations, various size reduction techniques. | | | | | |
| Course Outcomes | | | | | | |
| CO1 | To Introduce the concept of unit operation and their role in chemical engineering industries, Types of mechanical operations, Particle size and shape, Measurement and analysis, various size reduction techniques. | | | | | |
| CO2 | To familiarize with the concept of various methods of mixing of solids, Size enlargement: scope and applications and techniques, Filtration. | | | | | |
| CO3 | To understand the concept of Drag force, Settling velocity of a particle in a fluid, Stoke's law, Elutriation, Classifiers, Thickeners, Gravity separation, concept of relative velocity. | | | | | |
| CO4 | To familiarize with the concept of Storage of Solids, Flow of solids by gravity, Transport of solids, particle collection systems. | | | | | |

**Paper Setter's Note:** 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

## UNIT I

**Introduction to Unit operations:** Introduction to unit operation and their role in chemical engineering industries, Types of mechanical operation, Particle size and shape, Particulate mass, Size and shape distributions, Measurement and analysis, Concept of average diameter, Screening, types of screens, effectiveness of screens, particle separation efficiency.Mixing of solids, blending, kneading, etc., Filtration: classification of filters, theory of filtration, cake resistance.

## UNITII

**Size Reduction and Size Enlargement of Solids:** Size reduction, Crushing, Grinding and ultrafine grinding and selection of equipment, Laws of grinding. Construction and working principle of mostly used equipments, viz., Jaw crushers, gyratory crushers, hammer mill, crushing rolls, ball mills, and fluid energy mills. Size enlargement: scope and applications, size enlargement techniques, Agglomeration and compaction.

## UNITIII

**Drag force and Separation of solid particles:** Flow around' single particle, Drag force & drag coefficient, Settling velocity of a particle in a fluid, Stoke's law, Elutriation, Classifiers, Hindered & free settling of particles, Thickeners, Gravity separation, concept of relative velocity.

## UNIT IV

**Storage, Handling & Transport of Solids:** Storage of Solids, Flow of solids by gravity, Transport of solids by screw/ belt conveyors, pneumatic conveyors, cyclones, Bag filters, Electrostatic precipitators; particle collection systems.

**Books Recommended:**

1. J. M. Coulson & J. F. Richardson, Chemical Engineering, Vol. II, Pergamon press.
2. G. G. Brown, Unit Operations, Asia publishing House.
3. A. S. Foustetal, Principle of Unit Operations, John Wiley.
4. W. L. McCabe & J. C. Smith, Unit Operations of Chemical Engineering,McGraw Hill.
5. B. C. Bhattacharya & C. M. Narayanan, Mechanical Operations for Chemical Engineers,Khanna publishers.

| CHE - 208N | MEMBRANE PROCESSES | | | | | |
|---|---|---|---|---|---|---|
| Lecture | Tutorial | Practical | Theory | Sessional | Total | Time |
| 3 | 0 | - | 75 | 25 | 100 | 3 |
| Purpose | To understand basics of various unit processes such as Alkylation, Hydrogenation, Sulfonation, Halogenation and Nitration processes. | | | | | |
| Course Outcomes | | | | | | |
| CO1 | To understand the membrane transport mechanisms. | | | | | |
| CO2 | To familiarize with the physical and chemical properties of membranes. | | | | | |
| CO3 | To familiarize with the various membrane formation techniques. | | | | | |
| CO4 | To familiarize with thevarious separation processes. | | | | | |

**Paper Setter's Note:** 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

**UNIT- I**

**Mechanisms of Membrane Transport:** Fundamental, mechanisms of membrane transport. Gaseous diffusion. Membrane, osmosis and reverse osmosis, porosity, permeability, salt rejection, different membrane processes.

**UNIT- II**

**Properties of Membrane:** Physical and chemical properties of membranes, cellulosic and non-cellulosic membrane.

**UNIT- III**

**Membrane Formation Techniques:** Techniques of membrane formation, membrane characteristics, type of membrane modules, liquid membranes.

**UNIT- IV**

**Separation Processes**: Design, operation, maintenance and industrial applications of different membrane separation processes such as Reverse Osmosis, Ultra filtration, Electro Dialysis, nanofiltrationpervaporation dialysis.

**Books Recommended:**

1. S. Souriranjan, Reverse osmosis and synthetic Membranes - Technology and Engineering, National Research Council, Canada (1977).
2. S. Soururajan and Matusuura, Reverse Osmosis/ Ultra filtration Process Principles, National Research Council of Canada (1985)
3. B. Halley Baum, Membrane Separation Processes. Elsevier Scientific and White. R. A. publications.
4. Wilson and Sirkar, Membrane Handbook, Mc Grew Hill, London(2001).
5. Nune and Peinemann, Membrane Technology in Chemical Industries, Wiley, New York (2000).

| CHE - 210N | PROCESS INSTRUMENTATION | | | | | |
|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Theory** | **Sessional** | **Total** | **Time** |
| 3 | 0 | - | 75 | 25 | 100 | 3 |
| **Purpose** | To provide knowledge about fundamental principles of process instruments for various parameters. | | | | | |
| **Course Outcomes** | | | | | | |
| **CO1** | To understand the general principles of measurement, static and dynamic characteristics of instruments, sensors and transducers. | | | | | |
| **CO2** | To understand the fundamentals of temperature measurement and liquid level measurement | | | | | |
| **CO3** | To familiarize with the concept of flow measurements, pressure measurement | | | | | |
| **CO4** | To familiarize with the basic principles of composition measurement, measurement of viscosity, conductivity, humidity, pH and nuclear radiations, Gas chromatography, mass spectroscopy. | | | | | |

**Paper Setter's Note:** 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

## UNIT I

**Introduction:** General principles of measurement, static and dynamic characteristics of instruments, sensors and transducers.

**Process Instruments**

Recording instruments, indicator and signaling instruments, transmission of instrument reading control centre, instrumentation diagram, on line instrumentation in modern plants.

## UNIT II

**Temperature Measurement:** Thermocouple resistance thermometers, bimetallic thermistors, optical and radiation pyrometer.

**Liquid Level Measurement:** Direct and differential method for the measurement in open pressure vessels.

## UNIT III

**Flow Measurements:** Use of obstruction type meters, variable area pressure probe, positive displacement type meters, electromagnetic flowmeters and mass flow meters.

**Pressure Measurement:** Use of manometer, bourdon and bellow, type gauge, measurement of vacuum, pressure transducers.

## UNIT IV

**Miscellaneous Measurements:** Composition measurement, measurement of viscosity, conductivity, humidity, pH and nuclear radiations. Instruments for gas analysis.Gas chromatography, mass spectroscopy.

**Books Recommended:**

1. D. P. Eckman, Industrial Instrumentation, Wiley Eastern Ltd, 1975.
2. W.G. Andrew, Applied Instrumentation in process Industries Vol. I &II, Gulf K Pub. Co., 1947.
3. F.W. Kerk, Instrumentation, Wiley Eastern Ltd., Rimbai&Tarapore D.B., 1983.
4. D. N. Considine, Process Instruments and controls handbook, MGH.

| CHE-212-N | NANOTECHNOLOGY | | | | | |
|---|---|---|---|---|---|---|
| Lecture | Tutorial | Practical | Theory | Sessional | Total | Time |
| 3 | 0 | - | 75 | 25 | 100 | 3 |
| Purpose | To provide knowledge about the nanoscience and nanotechnology and its applications. | | | | | |
| Course Outcomes | | | | | | |
| CO1 | To understand the about the physical state, structure and bonding of nanoscience and nanotechnology. | | | | | |
| CO2 | To understand the synthesis of nanomaterials. | | | | | |
| CO3 | To familiarize with the characterization techniques of nanomaterials. | | | | | |
| CO4 | To familiarize with the applications of the nanotechnology. | | | | | |

**Paper Setter's Note:** 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

**Unit-I**

**Introduction**: the physics of solid state; Structure & Bonding, Elements of nanoscience& nanotechnology.

**Unit-II**

**Synthesis of nanomaterials**: General approaches, Physical Methods, Chemical Methods & Biological Methods; Properties of nanomaterials: Mechanical, Structural, Thermal, Electrical & Optical properties.

**Unit-III**

**Characterization techniques of nanomaterials**: Microscopy; Spectroscopy; & Diffraction techniques; Some special nanomaterials: Carbon nanotubes, Porous silicon, Zeolites, Aerogels, Core-shell nanoparticles.

**Unit-IV**

**Application**: Nanolithography, Nanocomposites, Nanoparticles as catalyst, conducting polymers; nanotechnology: DNA Nanowires, Nanomedicines.

**Books Recommended:**

1. Nanotechnology: Principles & Practices; Sulabh K. Kulkarni, Capital Publishing Company, Kolkata References.
2. Principles of nanotechnology: N. Phanikumar; Scitech, Kolkata.
3. Introduction to nanotechnology: Charles P. Poole & Frank Li Owens, Wiley India (p) Ltd, New Delhi.

| CHE- 214N | MECHANICAL OPERATIONS LAB | | | | | |
|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Practical** | **Sessional** | **Total** | **Time** |
| - | - | 3 | 60 | 40 | 100 | 3 |
| **Purpose** | To provide the practical knowledge for the application of theories of Drag coefficient, Sedimentation, size reduction, grinding, screen analysis, separation of particles from air, filtration of slurry, Elutriation and the pressure drop in packed bed. | | | | | |
| **Course Outcomes** | | | | | | |
| **CO1** | Students will be able to know the concept of Drag coefficient, Sedimentation, Size reduction. | | | | | |
| **CO2** | Students will be able to know the principle and working of grinding in a ball mill, separation of dust particles from air and filtration of slurry. | | | | | |
| **CO3** | Students will be able to know the solid separation techniques and size distribution of particles | | | | | |
| **CO4** | Students will be able to determine the pressure drop in a packed bed. | | | | | |

**LIST OF EXPERIMENTS:**

1. Drag coefficient:Determination of drag coefficient from the plot of drag coefficient Vs modified Reynolds No. and verify Stroke's law.
2. To carry out Batch Sedimentation.
3. Size reduction: To determine the efficiency of the roll crusher for crushing a material of known working index.
4. Grinding in a Ball Mill:
   (a) To determine the critical speed, work index, Bond's law,Rittenger's law, Kick's law.
   (b) To determine the surface area generation for the given amount of feed.
5. Screen Analysis: To analyze sample for size distribution using sieve shaker.
6. Separation of dust particles from air:
   (a) To study the performance of given cylinder (efficiency vs. dp).
   (b) To study the effect of inlet gas velocity on overall efficiency.
   (c) To study the effect of solid concentration or dp or Drop.
7. Packed bed: Determination of pressure drop packed bed
8. Filtration of slurry: To calculation specific cake resistance and medium resistance in plate and frame filter press.
9. Elutriation: To analyze given sample of sand using Elutriator.

| CHE- 216N | HEAT TRANSFER LAB | | | | | |
|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Practical** | **Sessional** | **Total** | **Time** |
| - | - | 3 | 60 | 40 | 100 | 3 |
| **Purpose** | To provide practical knowledge of the application of different modes of heat transfer theory, heat transfer through composite walls, pipe and rod. | | | | | |
| **Course Outcomes** | | | | | | |
| **CO1** | Student will be able to determine heat transfer coefficient. | | | | | |
| **CO2** | Student will be able to determine Filmwise and Dropwise condensation. | | | | | |
| **CO3** | Student will be able to determine LMTD, Thermal conductivity, Emissivity. | | | | | |
| **CO4** | Student will be able to determine Stefan Boltzman constant. | | | | | |

**LIST OF EXPERIMENTS:**

1. To determine total thermal resistance and total thermal conductivity of composite wall.
2. To determine the thermal conductivity of insulating powder.
3. To find out heat transfer coefficient of vertical cylinder in natural convection.
4. (a) To study the unsteady state heat transfer and compare theoretical vs. practical value of response
   (b) To determine the convective heat transfer coefficient.
5. (a) To determine the heat flow rate through the lagged pipe for known value of thermal conductivity of lagging material.
   (b) To plot the temperature distribution across the lagging material.
6. To calculate LMTD for parallel and counter flow in double pipe heat exchanger.
7. To find average heat transfer coefficient for dropwise and filmwise condensation and find the overall heat transfer coefficient.
8. To study the temperature distribution along the length of a pin fin under natural convection heat transfer.
9. To study the temperature distribution along the length of a pin fin under forced convection heat transfer.
10. To find the emissivity of the test plate surface at various temperature and compare with the actual reported value.
11. To determine the thermal conductivity of metal rod.
12. (i) To demonstrate super thermal conductivity heat pipe and to compare its working with that of best conductor
    (ii) To plot temperature vs. time response of three pipes
    (iii) Temperature distribution along length of three members at different time intervals can be plotted and nearly isothermal temperature distribution in case of heat pipe
13. To find out the Stefan Boltzmann constant
14. To find heat transfer coefficient for heated pipe and air is forced to flow through it for different air flow

## MPC-202N ENERGY STUDIES

| L | T | P |
|---|---|---|
| 3 | - | - |

Sessional: 25 Marks
Exam: 75 Marks
Total: 100 Marks
Time: 3 hrs

### UNIT-I

**Introduction**: Types of energy, Conversion of various forms of energy, Conventional and Nonconventional sources, Need for Non-Conventional Energy based power generation.
**Energy Management:** General Principles of Energy Management, Energy Management Strategy.
**Energy Audit & Tariffs:** Need, Types, Methodology and Approach.

### UNIT-II

**Conventional Energy sources:** Selection of site**,** working of Thermal, Hydro, Nuclear and Diesel power plants and their schematic diagrams & their comparative advantages- disadvantages.

### UNIT-III

**Non Conventional Energy sources:** Basicprinciple, site selection and power plant layout of Solar energy, photovoltaic technologies, PV Systems and their components, power plant layout of Wind energy, layout of Bio energy plants ,Geothermal energy plants and tidal energy plants.

### UNIT-IV

**Energy Scenario**: Lay out of power system, Role of Energy in Economic development, energy demand, availability and consumption, Commercial and Non-commercial energy, Indian energy scenario, long term energy scenario, energy pricing, energy sector reforms in India, energy strategy for the future.

**Paper Setter's Note:** 8 questions of 15 marks each distributed in four sections are to be set taking two from each unit. The candidate is required to attempt five questions in all, taking at least one from each of the four sections.

**Suggested Text Books & References:**

1. Energy Studies-Wiley and Dream tech India
2. Soni, Gupta, Bhatnagar: Electrical Power Systems – DhanpatRai& Sons
3. NEDCAP: Non Conventional Energy Guide Lines
4. G.D. Roy: Non conventional energy sources
5. B H Khan: Non Conventional energy resources - - McGraw Hill
6. Meinel A B and Meinal M P,Addison :Applied Solar Energy- Wesley Publications
7. George Sutton: Direct Energy Conversion - McGraw Hill

# Semester-IV (w.e.f. session 2016-2017)



| S N | Course No. | Course Title | Teaching Schedule | | | | Allotment of Marks | | | | Dur of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | Hrs /Wk | Theory | Sessional | Practical | Total | |
| 1 | HS-201N | Fundamentals of Management | 3 | 1 | 0 | 4 | 75 | 25 | 0 | 100 | 3 |
| 2 | CHE-202N | Heat Transfer | 4 | 1 | 0 | 5 | 75 | 25 | 0 | 100 | 3 |
| 3 | CHE-204N | Chemical Technology-I | 3 | 0 | 0 | 3 | 75 | 25 | 0 | 100 | 3 |
| 4 | CHE-206N | Mechanical Operations | 4 | 1 | 0 | 5 | 75 | 25 | 0 | 100 | 3 |
| 5 | CHE-208N | Membrane Processes | 3 | 0 | 0 | 3 | 75 | 25 | 0 | 100 | 3 |
| 6 | CHE-210N | Process Instrumentation | 3 | 0 | 0 | 3 | 75 | 25 | 0 | 100 | 3 |
| 7 | CHE-212N | Nanotechnology | 3 | 0 | 0 | 3 | 75 | 25 | 0 | 100 | 3 |
| 8 | CHE-214N | Mechanical Operations Lab | 0 | 0 | 3 | 3 | 0 | 40 | 60 | 100 | 3 |
| 9 | CHE-216 N | Heat Transfer Lab | 0 | 0 | 3 | 3 | 0 | 40 | 60 | 100 | 3 |
| | | **Total** | **23** | **3** | **6** | **32** | **525** | **255** | **120** | **900** | |
| 10 | MPC-202N | Energy Studies* | 3 | 0 | 0 | 3 | 75 | 25 | 0 | 100 | 3 |

*MPC-202N is a mandatory course and student has to get passing marks in order to qualify for the award of degree but its marks will not be added in the grand total.

**NOTE**: All the students have to undergo six weeks industrial training after IV semester and it will be evaluated in V semester.