



DR. V. S. KRISHNA GOVT. DEGREE COLLEGE (A)
VISAKHAPATNAM



DEPARTMENT OF INDUSTRIAL CHEMISTRY

CO's

2018 – 2019

SEMESTER- 1

COURSE I: **Material and energy balances and utilities in chemical industry**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	Analyze the distinction between Atomic weight, Molecular weight and Equivalent Weight
CO2	Apply the flow diagrams for chemical engineering operations
CO3	Define and evaluate heat capacities of gases and gaseous mixtures and enthalpy changes
CO4	To explain the utilities in chemical industry: boiler, water, steam and air
CO5	To understand the concept of fluid flow and types of pumps

SEMESTER- II

Course II: **Inorganic Materials**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand and apply the manufacturing and physical properties of glass
CO2	To understand classification of cement, and analyze ingredients and their applications
CO3	Evaluate different types of fertilizers
CO4	To understand and evaluate Classification of alloys
CO5	To study the concept of manufacturing of paints, and create awareness on types and different types of pigments

Semester III

COURSE III: Cosmetics, fermentation, paints and pigments, sugar chemistry and industrial pollution

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand the classification and apply industrial preparation of cosmetics
CO2	To explain the general principle of fermentation process, and analyze manufacturing of antibiotics and synthesis of vitamins
CO3	To apply the concept of manufacturing of paints, and evaluate their types
CO4	To understand and create awareness on the concept of industrial manufacturing of sugar
CO5	To describe and analyze the concept of air pollution

Semester IV

COURSE IV: **Dyes, leather, paper, corrosion and industrial waste management**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand the classification and apply industrial preparation of Dyes
CO2	To study the concept of leather and analyze its manufacturing process
CO3	To study the manufacturing of pulp and paper and evaluate its use
CO4	To explain various types of corrosion and create awareness on its prevention methods
CO5	To describe and analyze the concept of solid waste management

Semester V

COURSE V: Drugs and pharmaceuticals, polymers and food additives

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand and create awareness on the synthesis of antipyretic agents, antibacterial and antifungal drugs
CO2	To study and apply the concept of polymerization and classification of polymers
CO3	To comprehend and analyze the concept of polymeric materials and their physical properties
CO4	To understand and create awareness on the concepts of electro analytical technique and thermo analytical technique
CO5	To apply and evaluate the general concept of food additives

Semester V

COURSE VI: Industrial chemical analysis and Instrumental methods of analysis

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To create awareness the concept of industrial chemical analysis with stastical calculations
CO2	To study the principal and evaluate industrial applications of UV-Visible spectrophotometer, IR and NMR
CO3	To understand the concept of instrumental methods and its applications in industry
CO4	To understand the concept of quality control and evaluate its applications in industry
CO5	To study the principle and application of spectrophotometer and atomic spectroscopy

Semester VI

COURSE VII: Oils and fats, fuel chemistry, lubricants and adhesives

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand and analyze the concept of soap and detergents
CO2	To explain and analyze classification of fuels and their calorific value
CO3	To gain knowledge and create on reforming petroleum and non-petroleum fuels
CO4	To attain knowledge and evaluate on lubricating materials and their classification
CO5	To explain and analyze the concepts of adhesives and its limitations

Semester - VI

COURSE VIII-A-1: **Chemical process economics, entrepreneurship and IPR**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand and create awareness on marketing skills
CO2	To apply and evaluate the need and necessity of entrepreneurship and principles of products selection and developments
CO3	To understand and analyze the attain financial statements and funds flow analysis
CO4	Apply and evaluate information on Licensing and registration and important provisions of Factory Act
CO5	To analyze knowledge on industrial designs and patents



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VISAKHAPATNAM



DEPARTMENT OF INDUSTRIAL CHEMISTRY

CO's

2019 – 2020

SEMESTER- 1

COURSE I: **Material and energy balances and utilities in chemical industry**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	Analyze the distinction between Atomic weight, Molecular weight and Equivalent Weight
CO2	Apply the flow diagrams for chemical engineering operations
CO3	Define and evaluate heat capacities of gases and gaseous mixtures and enthalpy changes
CO4	To explain the utilities in chemical industry: boiler, water, steam and air
CO5	To understand the concept of fluid flow and types of pumps

SEMESTER- II

Course II: **Inorganic Materials**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand and apply the manufacturing and physical properties of glass
CO2	To understand classification of cement, and analyze ingredients and their applications
CO3	Evaluate different types of fertilizers
CO4	To understand and evaluate Classification of alloys
CO5	To study the concept of manufacturing of paints, and create awareness on types and different types of pigments

Semester III

COURSE III: Cosmetics, fermentation, paints and pigments, sugar chemistry and industrial pollution

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand the classification and apply industrial preparation of cosmetics
CO2	To explain the general principle of fermentation process, and analyze manufacturing of antibiotics and synthesis of vitamins
CO3	To apply the concept of manufacturing of paints, and evaluate their types
CO4	To understand and create awareness on the concept of industrial manufacturing of sugar
CO5	To describe and analyze the concept of air pollution

Semester IV

COURSE IV: **Dyes, leather, paper, corrosion and industrial waste management**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand the classification and apply industrial preparation of Dyes
CO2	To study the concept of leather and analyze its manufacturing process
CO3	To study the manufacturing of pulp and paper and evaluate its use
CO4	To explain various types of corrosion and create awareness on its prevention methods
CO5	To describe and analyze the concept of solid waste management

Semester V

COURSE V: Drugs and pharmaceuticals, polymers and food additives

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand and create awareness on the synthesis of antipyretic agents, antibacterial and antifungal drugs
CO2	To study and apply the concept of polymerization and classification of polymers
CO3	To comprehend and analyze the concept of polymeric materials and their physical properties
CO4	To understand and create awareness on the concepts of electro analytical technique and thermo analytical technique
CO5	To apply and evaluate the general concept of food additives

Semester V

COURSE VI: **Industrial chemical analysis and Instrumental methods of analysis**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To create awareness the concept of industrial chemical analysis with stastical calculations
CO2	To study the principal and evaluate industrial applications of UV-Visible spectrophotometer, IR and NMR
CO3	To understand the concept of instrumental methods and its applications in industry
CO4	To understand the concept of quality control and evaluate its applications in industry
CO5	To study the principle and application of spectrophotometer and atomic spectroscopy

Semester VI

COURSE VII: Oils and fats, fuel chemistry, lubricants and adhesives

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand and analyze the concept of soap and detergents
CO2	To explain and analyze classification of fuels and their calorific value
CO3	To gain knowledge and create on reforming petroleum and non-petroleum fuels
CO4	To attain knowledge and evaluate on lubricating materials and their classification
CO5	To explain and analyze the concepts of adhesives and its limitations

Semester - VI

COURSE VIII-A-1: **Chemical process economics, entrepreneurship and IPR**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand and create awareness on marketing skills
CO2	To apply and evaluate the need and necessity of entrepreneurship and principles of products selection and developments
CO3	To understand and analyze the attain financial statements and funds flow analysis
CO4	Apply and evaluate information on Licensing and registration and important provisions of Factory Act
CO5	To analyze knowledge on industrial designs and patents



DR. V. S. KRISHNA GOVT. DEGREE COLLEGE (A)
VISAKHAPATNAM



DEPARTMENT OF INDUSTRIAL CHEMISTRY

CO's

2020 – 2021

SEMESTER- 1

COURSE I: **Material and energy balances and utilities in chemical industry**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	Analyze the distinction between Atomic weight, Molecular weight and Equivalent Weight
CO2	Apply the flow diagrams for chemical engineering operations
CO3	Define and evaluate heat capacities of gases and gaseous mixtures and enthalpy changes
CO4	To explain the utilities in chemical industry: boiler, water, steam and air
CO5	To understand the concept of fluid flow and types of pumps

SEMESTER- II

Course II: **Inorganic Materials**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand and apply the manufacturing and physical properties of glass
CO2	To understand classification of cement, and analyze ingredients and their applications
CO3	Evaluate different types of fertilizers
CO4	To understand and evaluate Classification of alloys
CO5	To study the concept of manufacturing of paints, and create awareness on types and different types of pigments

Semester III

COURSE III: Cosmetics, fermentation, paints and pigments, sugar chemistry and industrial pollution

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand the classification and apply industrial preparation of cosmetics
CO2	To explain the general principle of fermentation process, and analyze manufacturing of antibiotics and synthesis of vitamins
CO3	To apply the concept of manufacturing of paints, and evaluate their types
CO4	To understand and create awareness on the concept of industrial manufacturing of sugar
CO5	To describe and analyze the concept of air pollution

Semester IV

COURSE IV: **Dyes, leather, paper, corrosion and industrial waste management**

Learning Outcomes: On Completion of the course, the students will be able to	
CO1	To understand the classification and apply industrial preparation of Dyes
CO2	To study the concept of leather and analyze its manufacturing process
CO3	To study the manufacturing of pulp and paper and evaluate its use
CO4	To explain various types of corrosion and create awareness on its prevention methods
CO5	To describe and analyze the concept of solid waste management

Semester V

COURSE V: Drugs and pharmaceuticals, polymers and food additives

Learning Outcomes: On Completion of the course, the students will be able to	
CO1	To understand and create awareness on the synthesis of antipyretic agents, antibacterial and antifungal drugs
CO2	To study and apply the concept of polymerization and classification of polymers
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CO4	To understand and create awareness on the concepts of electro analytical technique and thermo analytical technique
CO5	To apply and evaluate the general concept of food additives

Semester V

COURSE VI: **Industrial chemical analysis and Instrumental methods of analysis**

Learning Outcomes: On Completion of the course, the students will be able to	
CO1	To create awareness the concept of industrial chemical analysis with stastical calculations
CO2	To study the principal and evaluate industrial applications of UV-Visible spectrophotometer, IR and NMR
CO3	To understand the concept of instrumental methods and its applications in industry
CO4	To understand the concept of quality control and evaluate its applications in industry
CO5	To study the principle and application of spectrophotometer and atomic spectroscopy

Semester VI

COURSE VII: Oils and fats, fuel chemistry, lubricants and adhesives

Learning Outcomes: On Completion of the course, the students will be able to	
CO1	To understand and analyze the concept of soap and detergents
CO2	To explain and analyze classification of fuels and their calorific value
CO3	To gain knowledge and create on reforming petroleum and non-petroleum fuels
CO4	To attain knowledge and evaluate on lubricating materials and their classification
CO5	To explain and analyze the concepts of adhesives and its limitations

Semester - VI

COURSE VIII-A-1: **Chemical process economics, entrepreneurship and IPR**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand and create awareness on marketing skills
CO2	To apply and evaluate the need and necessity of entrepreneurship and principles of products selection and developments
CO3	To understand and analyze the attain financial statements and funds flow analysis
CO4	Apply and evaluate information on Licensing and registration and important provisions of Factory Act
CO5	To analyze knowledge on industrial designs and patents



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VISAKHAPATNAM



DEPARTMENT OF INDUSTRIAL CHEMISTRY

CO & PO ATTAINMENT

2021 – 2022

SEMESTER- 1

COURSE I: **Material and energy balances and utilities in chemical industry**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	Analyze the distinction between Atomic weight, Molecular weight and Equivalent Weight
CO2	Apply the flow diagrams for chemical engineering operations
CO3	Define and evaluate heat capacities of gases and gaseous mixtures and enthalpy changes
CO4	To explain the utilities in chemical industry: boiler, water, steam and air
CO5	To understand the concept of fluid flow and types of pumps

SEMESTER- II

Course II: **Inorganic Materials**

Learning Outcomes: On Completion of the course, the students will be able to	
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Semester III

COURSE III: Cosmetics, fermentation, paints and pigments, sugar chemistry and industrial pollution

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand the classification and apply industrial preparation of cosmetics
CO2	To explain the general principle of fermentation process, and analyze manufacturing of antibiotics and synthesis of vitamins
CO3	To apply the concept of manufacturing of paints, and evaluate their types
CO4	To understand and create awareness on the concept of industrial manufacturing of sugar
CO5	To describe and analyze the concept of air pollution

Semester IV

COURSE IV: **Dyes, leather, paper, corrosion and industrial waste management**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand the classification and apply industrial preparation of Dyes
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CO3	To study the manufacturing of pulp and paper and evaluate its use
CO4	To explain various types of corrosion and create awareness on its prevention methods
CO5	To describe and analyze the concept of solid waste management

Semester V

COURSE VI: **Industrial chemical analysis and Instrumental methods of analysis**

Learning Outcomes: On Completion of the course, the students will be able to	
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CO2	To study the principal and evaluate industrial applications of UV-Visible spectrophotometer, IR and NMR
CO3	To understand the concept of instrumental methods and its applications in industry
CO4	To understand the concept of quality control and evaluate its applications in industry
CO5	To study the principle and application of spectrophotometer and atomic spectroscopy

Semester VI

COURSE VII: Oils and fats, fuel chemistry, lubricants and adhesives

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand and analyze the concept of soap and detergents
CO2	To explain and analyze classification of fuels and their calorific value
CO3	To gain knowledge and create on reforming petroleum and non-petroleum fuels
CO4	To attain knowledge and evaluate on lubricating materials and their classification
CO5	To explain and analyze the concepts of adhesives and its limitations

Semester - VI

COURSE VIII-A-1: **Chemical process economics, entrepreneurship and IPR**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	To understand and create awareness on marketing skills
CO2	To apply and evaluate the need and necessity of entrepreneurship and principles of products selection and developments
CO3	To understand and analyze the attain financial statements and funds flow analysis
CO4	Apply and evaluate information on Licensing and registration and important provisions of Factory Act
CO5	To analyze knowledge on industrial designs and patents



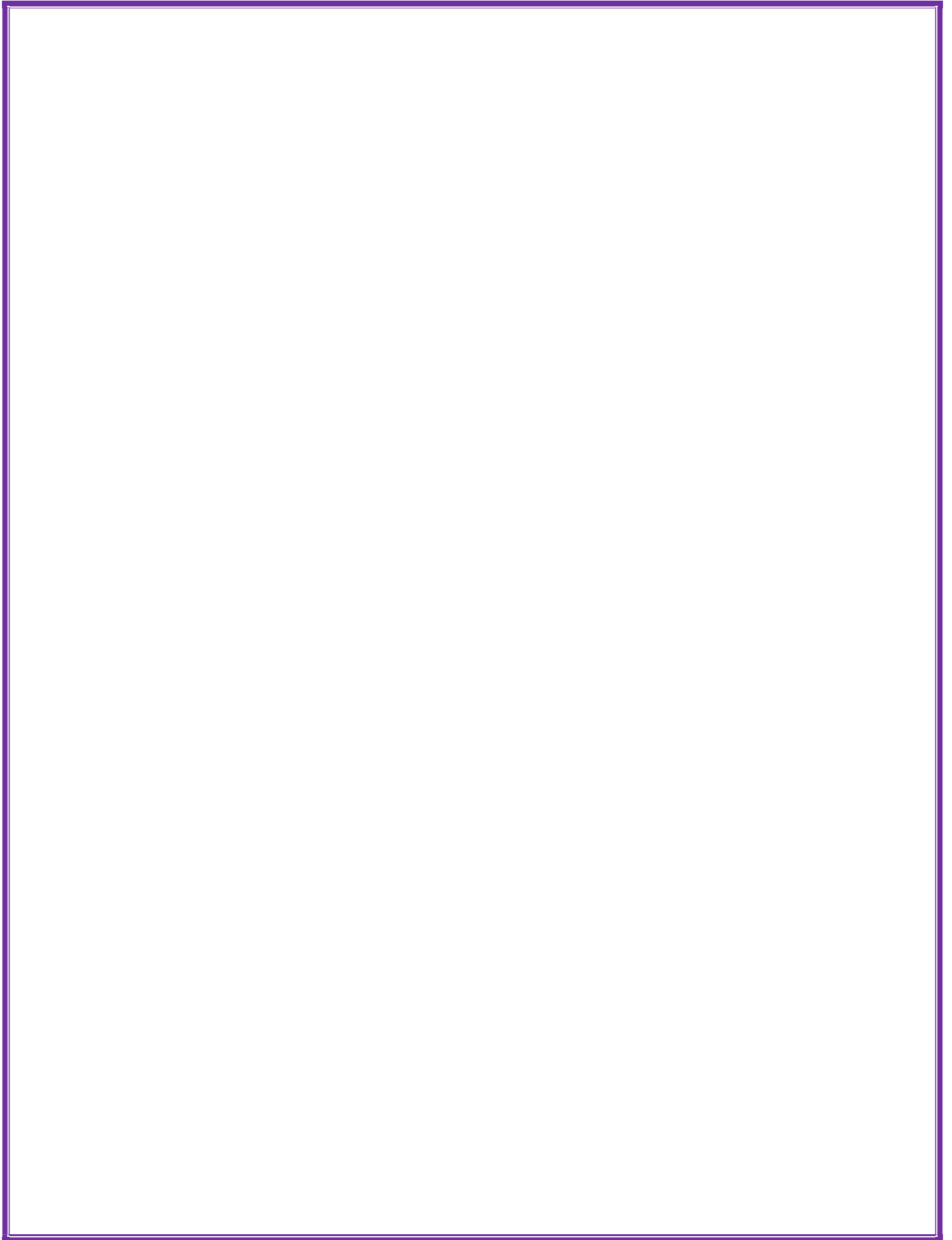
DR. V. S. KRISHNA GOVT. DEGREE COLLEGE (A)
VISAKHAPATNAM



DEPARTMENT OF INDUSTRIAL CHEMISTRY

CO ATTAINMENT

2022 – 2023



SEMESTER- 1

COURSE I: **Material and energy balances and utilities in chemical industry**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	Describe and apply the distinction between Atomic weight, Molecular weight and Equivalent Weight
CO 2	To understand and create awareness on the flow diagrams for chemical engineering operations
CO 3	Describe heat capacities of gases and gaseous mixtures
CO 4	To apply and analyze water treatment procedures for industrial use
CO 5	Apply and analyze the types of boilers
CO 6	Demonstrate and evaluate knowledge acquired in steam generation
CO 7	To get knowledge and analyze its applications of compressors and blowers
CO 8	To understand and apply classify pumps based on their function.

SEMESTER- II

Course II: **Inorganic Materials**

Learning Outcomes: On Completion of the course, the students will be able to	
CO 1	Describe the composition and manufacturing properties of different types of glasses and apply its applications in society.
CO 2	Write down different types of ceramics and their uses in society
CO 3	Describe and analyze the steps involved in the manufacturing of cement
CO 4	To understand and evaluate manufacturing of different fertilizers
CO 5	To describe and evaluate classification of alloys
CO 6	Demonstrate and execute the manufacture of steel
CO 7	To understand and analyze the differences between paints and pigments
CO 8	Explanation on different types of paints, analyze and create manufacturing methods