



**Sri Vani Degree & PG College**  
**Affiliated to SK University**  
**Kakkalapalli Cross ,Near Sakshi Office, Ananthapuram**  
**Andhra Pradesh, India -515002**



**Department Profile: Chemistry**

The Department of chemistry is established in the year 1999 with an UG Course-B.Sc.

The Department has a collection of Chemicals and Instruments for laboratory purpose.

**Vision:**

To Provide a strong foundation for a better understanding of practical and their significance.

**Mission:**

To equip Students with laboratory skills as well as field based studies to become a successful entrepreneur.

To inculcate knowledge and make successful career in Chemistry.

**Courses / Program offered:**

<b>Level</b>	<b>Course</b>
<b>UG</b>	B. Sc (B.t.mc)
	B. Sc (Bi. Z.C)

### Course Structure Under CBCS:

Year	Sem	Course	Title of the Course	Internal marks	External marks	Total marks
<b>I</b>	I	I	Inorganic and Organic Chemistry	25	75	100
			Practical-1	-	50	50
	II	II	Physical and General Chemistry	25	75	100
			Practical-2	-	50	50
<b>II</b>	III	III	Inorganic and Organic Chemistry	25	75	100
			Practical-3	-	50	50
	IV	IV	Spectroscopy and Physical Chemistry	25	75	100
			Practical-4	-	50	50
<b>III</b>	V	V	Inorganic , Organic and Physical Chemistry	25	75	100
			Practical-5	-	50	50
		VI	Inorganic , Organic and Physical Chemistry	25	75	100
			Practical-6	-	50	50
	Any One Paper From VII A,B and C	VII (A)	Elective	25	75	100
			Practical-7(A)	-	50	50
		VII (B)	Elective	25	75	100
			Practical-7(B)	-	50	50
	Any one Cluster from VIII, A,B, and C	VII (C)	Elective	25	75	100
			Practical-7 (C)	-	50	50
		VIII(A)	<b>Cluster Electives – I</b>	25	75	100
			VIII-A-1	25	75	100
VI	VIII(A)	VIII-A-2	25	75	100	
		VIII-A-3	25	75	100	

	VIII (B)	<b>Cluster Elective-2</b>	25	75	100
		VIII-B-1	25	75	100
		VIII-B-2	25	75	100
		VIII-B-3	25	75	100
	VIII (C)	<b>Cluster Elective-3</b>	25	75	100
		VIII-C-1	25	75	100
		VIII-C-2	25	75	100
		VIII-C-3	25	75	100

- Participation of interdisciplinary course and the department / unit involved : NILL
- Participation of the department in the courses offered by other departments : NILL
- Courses collaboration with other universities, industries, foreign institution : NILL
- Details of courses/ programs discontinued (if any) with reason :NILL

#### Number of Teaching Posts:

Post	Sanctioned	Filled
Teaching	01	01

#### Program outcomes, Program Specific Outcomes & Course Outcome :

Program Outcomes	
<b>P01</b>	<b>Critical Thinking:</b> The curriculum made for the betterment of the students; enhance the ability and thinking power of the students.
<b>P02</b>	<b>Effective Communication :</b> The complete medium of program is learning in english so students will communicate well in the english. Which help in effective communication.
<b>P03</b>	<b>Social Interaction:</b> Due to Continuous interaction with students in term of various programs run by department i.e. curiosity thirsty for knowledge program, celebration of 'Birth day ' of Teaching Staff and Students, extension activity. Helps to increase social interaction.
<b>P04</b>	<b>Effective Citizenship</b> Being the students of chemistry they have to communicate with people, They have developed skills in interaction among themselves in PPT competition under curiosity

	Program.
<b>P05</b>	<b>Ethics</b> The Subject teaches Students about the ethical approach , not to waste electrically.
<b>P06</b>	<b>Environment and Sustainability:</b> Conservation practices are studied for sustainable development.

**Program Specific Outcomes**

<b>PS01</b>	Students are expected to acquire a core knowledge in chemistry ,Including the major premise of organic , Inorganic and physical chemistry.
<b>PS02</b>	Students are also expected to develop written and oral communication skills in chemistry – related topics.
<b>PS03</b>	Students should Learn how to design and conduct an experiments demonstrating their understanding of the scientific method and processes. Not only that they are expected to have an understanding of the chemical method required to interpret and analyze the result.
<b>PS04</b>	Students will develop the proficiency in the acquisition of data using a variety of laboratory chemicals.
<b>PS05</b>	Students will learn the application of a numerical techniques for modeling chemical system .
<b>PS06</b>	Apply conceptual understanding of the chemistry to general real-world situation
<b>PS07</b>	Describe the methodology of science and the relationship between observation and theory.

## **Course Outcomes:**

### **SEMESTER – 1**

#### **TITLE OF THE COURSE : INORGANIC & ORGANIC CHEMISTRY**

On successful completion of this course students will :

1. Understand the synthesis and structure of diborane and higher boranes
2. Understand the classification of oxides based on chemical behavior and oxygen content.
3. Understand the classification of organometallic compounds and their application.
4. Understand the types of bond fission and reagents, Bond polarization and types of organic reactions.
5. Understand the preparation of alkenes and alkynes in acyclic hydrocarbons.
6. Understand the Baeyer's strain theory, Sachse and Mohr predictions and Pitzer's strain theory.
7. Understand the Benzene and its Reactivity.

### **SEMESTER – 2**

#### **TITLE OF THE COURSE : PHYSICAL & GENERAL CHEMISTRY**

On successful completion of this course students will :

1. Understand the x-ray diffraction and crystal structure and Bragg's law.
2. Understand the vander waal's equation of state and P-V Isotherm of real gas, andrew's isotherms of CO<sub>2</sub>, and continuity of state.
3. Understand the structural difference between solids, liquids, and gases.
4. Understand the Raoult's law, Henry's law and Nernst distribution law in solution.
5. Understand the Definition of colloids ,preparation and properties of surface chemistry.
6. Under the Valence Bond Theory (VBT) in chemical Bonding.
7. Understand the Molecular Representation of carbon compounds.

### **SEMESTER – 3**

#### **TITLE OF THE COURSE : INORHANIC AND ORGANIC CHEMISTRY**

1. Understand the characteristics of d-block elements with special reference to electronic configuration.
2. Understand the VBT (valence bond theory), Free electron theory , and Band theory (Molecular Orbital Theory[MOT]) .
3. Understand the conductors, semi conductors, and insulators.
4. Understand EAN rule , classification of metal carbonyls, structure and shape.
5. Understand the electronic structure and oxidation states of lanthanides and actinides.
6. Understand the preparation and properties of alcohols and phenols.

7. Understand the reaction and mechanism of carbonyl compounds.
8. Understand the carboxylic acids and their derivatives.

#### **SEMESTER –4**

##### **TITLE OF THE COURSE : SPECTROSCOPY & PHYSICAL CHEMISTRY**

1. Understand the applications and limitations of Beer-Lambert law
2. Understand the interaction of electromagnetic radiation with molecular and types of molecular spectra.
3. Understand about the **Infra red Spectroscopy (IR)** and **Nuclear Magnetic Resonance Spectroscopy (NMR)**.
4. Understand the colligative properties in dilute solution.
5. Understand the Arrhenius theory of electrolyte dissociation and its limitation.
6. Understand the Debye-Hückel-Onsager's equation for strong electrolytes.
7. Understand the reversible and Irreversible cells and Nernst Equation- reference electrode, Standard hydrogen electrode, calomel electrode, indicator electrode, metal-metal ion electrode and inert electrode.
8. Understand the thermodynamic derivation of Gibbs phase rule.

#### **SEMESTER –5 PAPER (V)**

##### **TITLE OF THE COURSE : INORGANIC, PHYSICAL & ORGANIC CHEMISTRY**

1. Understand the geometries of coordination numbers 4-tetrahedral, square planar and 6-octahedral and its limitation.
2. Understand the types of magnetic behavior.
3. Understand the stability of metal complexes.
4. Understand the preparation methods and reactivity of nitro hydrocarbons.
5. Understand the physical and basic character of amides and Schmidt reaction.
6. Understand the classification of amines [primary( $1^0$ ), secondary( $2^0$ ) and tertiary( $3^0$ )] and preparation methods.
7. Understand the first law and second law of thermodynamic.

## **PAPER –VI**

### **TITLE OF THE COURSE : INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY**

1. Understand the reactivity metal complexes.
2. Understand the biological significance of elements and structure and functions of Hemoglobin, myoglobin and chlorophyll.
3. Understand the derivation of rate constants for first, second, third and zero order reaction.
4. Understand the laws of photochemistry-grothus-draper's law and Stark-Einstein's law of photochemical equivalence.
5. Understand the aromatic characters of furan, thiophene and pyrrole.
6. Understand the monosaccharide of glucose and fructose.
7. Understand the interconversion of monosaccharide.
8. Understand the zwitter ion structure, solubility, melting point, amphoteric character and definition of isoelectric point.

## **SEMESTER –VI (Electives) Paper-VII-(A)**

### **TITLE OF THE COURSE : ANALYTICAL METHODS IN CHEMISTRY**

1. Understand the volumetric analysis of acid-base, redox, complexometric, iodometric and precipitation titration methods.
2. Understand the gravimetric analysis of precipitation, coagulation, peptization, Co-precipitation and post precipitation.
3. Understand the types of errors, significant figures and importance of accuracy and precision.
4. Understand the solvent extraction.
5. Understand the Ion extraction.
6. Understand the classification of chromatographic technique and principle of paper chromatography.
7. Understand the thin layer and column Chromatography.
8. Understand the HPLC (High Performance Liquid Chromatography).

## **SEMESTER-VI (Electives) Paper-VII-(B)**

### **TITLE OF THE COURSE : ENVIRONMENTAL CHEMISTRY**

1. Understand the renewable resources and non-renewable resources.
2. Understand concept of environmental chemistry.



3. Understand the source of air pollution.
4. Understand the physical and chemical properties of water.
5. Understand the hardness of water and permanent hard water.
6. Understand what type of toxic chemicals present in the environment.
7. Understand the energy flow and energy dynamics of ecosystem.
8. Understand the biogeographical classification of india.

### **SEMESTER-VI**

#### **ELECTIVE PAPER- VII-( C )**

##### **TITLE OF THE COURSE: GREEN CHEMISTRY**

1. Understand the organic reaction by sonication method example of sonication (Heck, Hundsdiecker and witting reaction).
2. Understand the green synthesis.
3. Understand the preparation, properties and applications of super critical CO<sub>2</sub>.
4. Understand the MAOS , aldol condensation-cannizzaro reaction- diels-Aldel reaction and Strecker's synthesis.
5. Understand the heterogeneous catalysis, use of zeolites, silica alumina and supported catalysis.
6. Understand the biocatalysis.
7. Understand the microwave assisted reaction in water and ultrasound assisted reaction.

### **SEMESTER – VI**

#### **CLUSTER ELECTIVES : Cluster Elective-1**

##### **CLUSTER PAPER-VIII-A-1**

##### **TITLE OF THE COURE : POLYMER CHEMISTRY**

1. Understand the classification of polymers , addition of polymers ,condensation of polymers and mechanism polymers.
2. Understand the technique of polymers and molecular weight of polymers.
3. Understand the glass transition temperature (T<sub>g</sub>).
4. Understand the kinetics of free radical polymerization.
5. Understand the plastic additives.
6. Understand the preparation and industrial applications of polyethylene, polyvinyl chloride, Teflon, polyacrylonitrile , terelene, nylon6.6 silicones.

## **SEMESTER-VI**

### **CLUSTER PAPER-VIII-A-2:**

#### **TITLE OF TH COURSE : INSTRUMENTAL METHODS OF ANALYSIS**

1. Understand the classification of analytical methods.
2. Understand the types of instrumental methods.
3. Understand the IR spectroscopy.
4. Understand the advantage of Fourier Transform (FTIR)
5. Understand the UV-visible and near IR Spectroscopy.
6. Understand the single and double beam instrumentation.
7. Understand the separation techniques.
8. Understand the mass spectroscopy , NMR Spectroscopy, electroanalytical methods and Radiochemical methods.

## **SEMESTER-VI**

### **CLUSTER PAPER –VIII-A-3**

#### **TITLE OF THE COURSE : ANALYSIS OF DRUGS, FOODS, DAIRY**

#### **PRODUCTS & BIO-CHEMICAL ANALYSIS**

1. Analysis of drug in the treatment of infections and infestations.
2. Analysis of analgesics and antipyretics like aspirin and paracetamol.
3. Analysis of antihistamine drugs and sedatives.
4. Discuss the use of drug for cardiovascular.
5. Understand the analysis of diuretics like ; furosemide (Lasix), triamterene.
6. Analysis of milk and milk product.
7. Discuss the clinical analysis of blood.

**HoD Profile :****Name** : Ramavath Babu Naik**Qualification** : M.Sc in Chemistry**Experience** :01**Faculty Profile :**

Name	Qualification	Designation	Specialization	Teaching Experience
R. Babu Naik	M. Sc	Lecture in Chemistry	Analytical Chemistry	01

**List of visiting Faculty :**

Name	Designation	Institute	Teaching Experience

**Percentage of lecturers delivered and practical classes handle :**

Name of the faculty	Total work load	Classes handled	Practical Classes
R.BABU NAIK	04	04	04

**Student-Teaching Ratio :**

Level	Class	Number of Teachers	Student Teach Ratio
UG	I B sc	01	21:1
	II B sc		21:1
	III B sc		13:1

**Number of Academic Staff(technical) and administrative staff:**

	<b>Sanctioned</b>	<b>Filled</b>
Lab Assistants	01	01
Lab Attendants	01	-

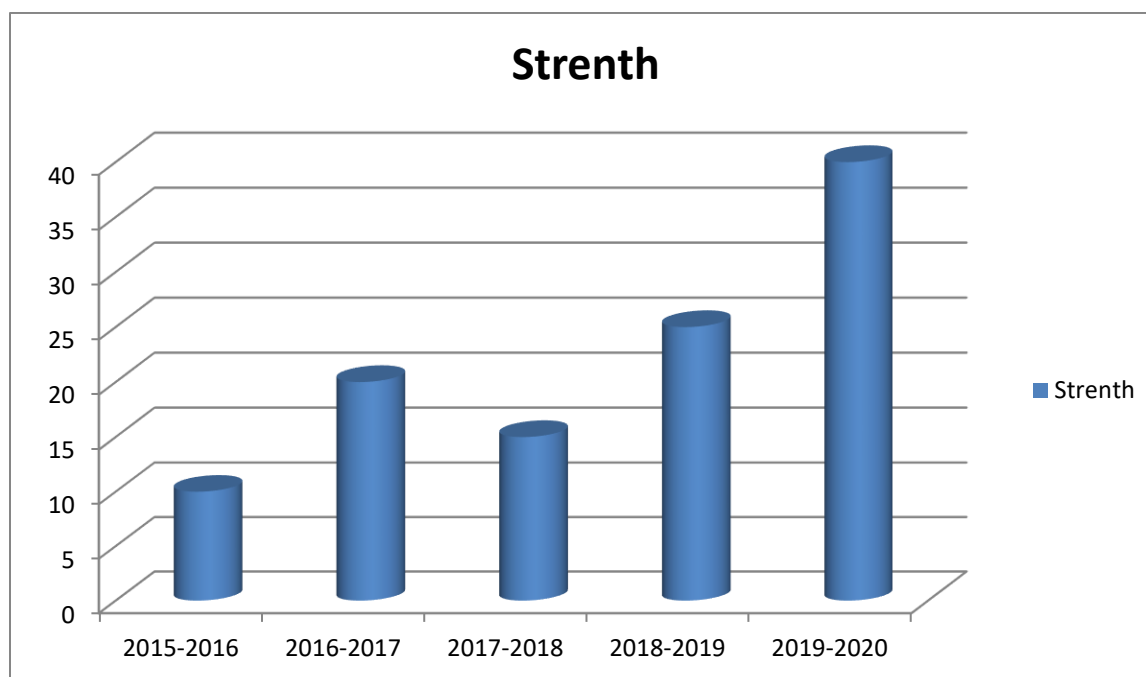
**Qualification of Teaching Faculty :**

<b>PDF</b>	<b>PhD</b>	<b>M.Phil</b>	<b>PG with NET/SLET</b>	<b>PG</b>
-	-	-	-	01

- List of eminent academicians and scientists / visitors to the department
- Seminars/ Conference / Workshops Organized

**Student Profile program wise :**

<b>Name of the Course</b>	<b>Year</b>	<b>Total Seats</b>	<b>Enrolled</b>		<b>Total</b>
			<b>Male</b>	<b>Female</b>	
B.Sc (Bi.Z.c & Bt.mc)	2015-2016	50	06	14	20
	2016-2017	50	03	22	25
	2017-2018	50	01	12	13
	2018-2019	50	02	17	19
	2019-2020	50	04	30	34



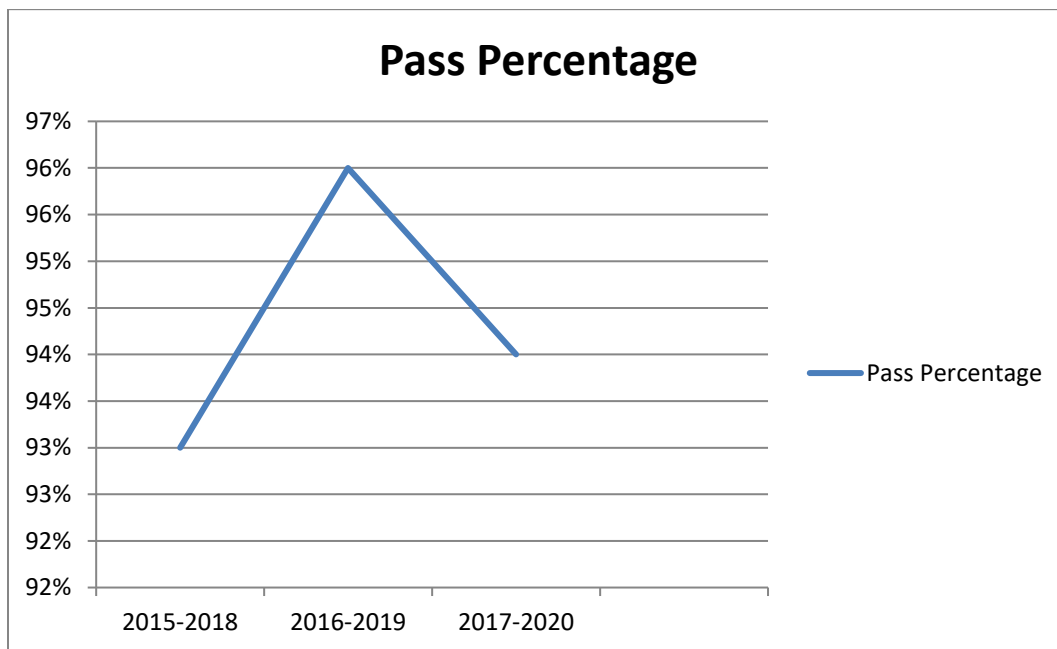
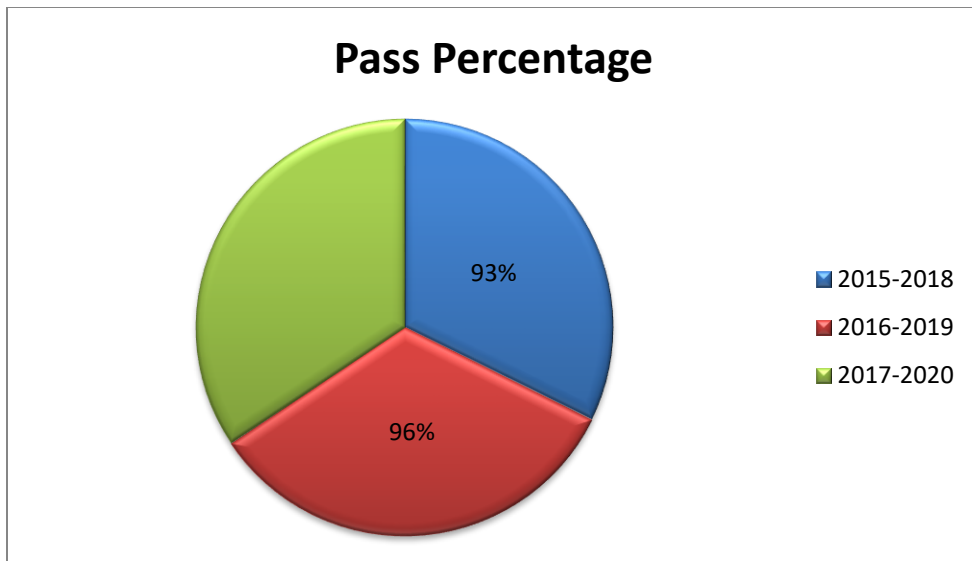
**Pass Percentage :**

Year	Month	Semester	Appeared		Pass		Pass Percentage
			Male	Female	Male	Female	
2015-2016	Nov/Dec	I	5	14	3	16	91%
	Mar/Apr	II	2	14	3	16	91%
2016-2017	Nov/Dec	I	2	13	2	13	100%
		III	2	20	2	18	100%
	Mar/Apr	II	2	20	2	20	100%
		IV	2	13	2	13	100%
2017-2018	Nov/Dec	I	1	16	1	15	66%
		III	2	19	2	18	95%
		V(P-5)	2	12	2	18	71%
		V(P-6)	2	12	2	18	71%
	Mar/Apr	II	1	15	1	15	100%
		IV	2	19	1	19	95%
		VII(ELE)	2	11	2	10	95%
2018-2019	Nov/Dec	I	2	16	1	10	94%
		III	1	12	1	9	76%
		V(P-5)	2	17	2	12	73%
		V(P-6)	2	17	2	13	94%
	Mar/Apr	II	2	16	1	11	66%
		IV	1	12	2	10	83%
		VII(ELE)	2	17	2	17	100%

2019-2020	Nov/Dec	I	5	34	05	29	87%
		III	2	15	00	11	64%
		V(P-5)	1	12	00	10	83%
		V(P-6)	1	12	01	09	83%
	Mar/Apr	II	14	16	02	23	83%
		IV	-	-	-	-	-
		VII(ELE)	1	12	01	12	92%
2020-2021	Nov/Dec	I					
		III					
		V(P-5)					
		V(P-6)					
	Mar/Apr	II					
		IV					
		VII(ELE)					

**Overall Year wise Pass Percentage:**

<b>Year</b>	<b>Pass Percentage</b>
2015-2018	93%
2016-2019	96%
2017-2020	94%



#### Details of Infrastructure facilities :

#### Library:

There is no Separate Department library. But has a central library for the need of students and staff.

**Internet facility for Staff and Students:**

Yes it is available only for staff member.

**Classroom with ICT facility :**

Yes

**Laboratories:**

Yes, Department has single lab

**Teaching methods adopted to improve student learning:**

- Lecture
- Demonstration
- Practical
- Assignment's
- Power point presentation's
- Class seminars
- Quiz
- Question paper discussion
- Slip test

**Facilities:**

- Laboratory is well Equipped with instrument's , Chemicals and full fledges space.

**Library books : Chemistry**

- A Text book of Chemistry
- A manual of Chemistry
- Chemistry I
- Chemistry II
- Chemistry III
- Unified course in Chemistry (Vol-I)
- Unified course in Chemistry (Vol-II)
- Unified course in Chemistry (Vol-III)
- Chemistry Semester P-I
- Chemistry Semester P-II
- Chemistry Semester P-III
- Chemistry Semester P-IV
- Chemistry Semester P-V (Paper –V)
- Chemistry Semester P-V(Paper-VI)
- Chemistry Practical-I



- Chemistry Practical-II
- Chemistry Practical-III
- Chemistry Practical-IV
- Chemistry Practical-V

**Equipments:**

- UV Spectrophotometer
- Hot air Oven
- Colorimeter
- Water bath
- Physical balance
- Weighing Machine

**Glassware:**

- Conical Flask
- Beakers
- Volumetric flask
- Centrifuge tube
- Standard flask
- Burettes
- Burette Stand
- Pipettes
- Test tube
- Watch glass
- Holder
- Spatula
- Thermometer
- Motor & Pestle
- Funnels
- Reagent bottles
- Measuring jar











