

B.L.D.E.Association's

**S.B.Arts and K.C.P. Science College**

**Vijayapur**

**PG DEPARTMENT OF CHEMISTRY**



**Programme Outcomes (POs) ,**  
**Programme Specific Outcomes(PSOs)**  
**and Course Outcomes (COs)**

B.L.D.E. Association's  
**S.B. Arts and K.C.P Science College Bijapur**  
Post Graduate Department of Chemistry  
POS 2019-2020  
**Subject: Spectroscopy**

**PO1:** In advance elementary/fundamental knowledge.

**PO2:** Critical thinking, scientific methods to design, carry out analytical the results of experiments and get awareness of the impact of chemistry on environment, society, etc.

**PO3:** Higher education, competitive, Reputed Research laboratory.

**PO4:** Industrial application.

**PSO1:** To develop strong and compete knowledge in theoretical and practical chemistry.

**PSO2:** Able to explain Theory, Principle, Postulates, Methods, explaining instrumentation, Derivation, calculations and to calculate the physical and electrochemical parameters

**PSO3:** To recognize the various laws and theories and solving numerical problems.

**PSO4:** To develop various technical and analytical skills through laboratory training.

**POS5:** To create awareness the importance. And impact of chemistry on environment.

**M.Sc 1<sup>st</sup> Sem: Spectroscopy-I**

**CO1:** Review of different types of electromagnetic radiations.

**CO2:** Study the types of transitions and their energy levels.

**CO3:** Understand the selection rules.

**CO4:** Study the classification of polyatomic molecules ( $\text{CO}_2$ ,  $\text{CH}_3\text{F}$  and  $\text{BCl}_3$ ) based on moment of inertia-linear, symmetric top and asymmetric top.

**CO5:** To know the detail study of UV-Visible Spectroscopy.

**C06:** To study the  $\lambda_{\max}$  for polyenes,  $\alpha,\beta$ -unsaturated aldehydes and ketones (Woodward-Fieser rules), aromatic systems and their derivatives.

**C07:** To know about the number of degrees of freedom of vibration, modes of vibration and, Vibrational coupling overtones and Fermi resonance.

**C08:** To study the brief discussion of identification of functional groups alkanes, alkenes, aromatics, carboxylic acids, carbonyl compounds (aldehydes and ketones, esters), amides and amines.

**C09:** To study the principle, instrumentation and applications of Raman Spectra

**COURSE : M.Sc 1<sup>st</sup> Semester ( Theory)**

**Course Code : CHGT-1.4**

**Subject: Spectroscopy-I**

<b>Course Outcomes</b>	<b>P01</b>	<b>P02</b>	<b>P03</b>	<b>P04</b>	<b>PS01</b>	<b>PS02</b>	<b>PS03</b>	<b>PS04</b>	<b>PS05</b>
C01	2	2	3	3	1	3	3	2	3
C02	1	1	3	2	3	3	3	2	3
C03	-	2	1	3	3	3	3	2	3
C04	-	3	2	2	3	3	3	2	3
C05	3	2	1	3	3	3	3	2	3
C06	2	3	2	1	3	3	3	2	3
C07	2	1	1	3	3	3	3	2	3
C08	-	3	2	1	3	3	3	2	3
C09	-	3	1	1	3	3	3	2	3

## **M.Sc 2<sup>nd</sup> Sem: Spectroscopy-II**

**C01:** To understand the magnetic properties of nuclei.

**C02:** To learn about the various factors influencing in NMR spectroscopy.

**C03:** To know about the principle, instrumentation and applications of FT-NMR spectroscopy.

**C04:** To study the brief discussion of simplification of complex spectra.

**C05:** To know the detail study of the <sup>13</sup>C-NMR spectroscopy.

**C06:** To learn about the two dimensional NMR spectroscopy (COSY, NOESY, DEPT Spectra and MRI).

**C07:** To know the detail study of the mass spectroscopy.

**C08:** To understand the basic theory, principle and instrumentation of different mass spectroscopy techniques.

**C09:** To know about the modes of fragmentation and their rules for different class of organic compounds.

**C010:** Combined applications of spectroscopic techniques.

**COURSE : M.Sc II<sup>nd</sup> Semester ( Theory)**

**Course Code : CHGT-2.4**

**Subject: Spectroscopy-II**

<b>Course Outcomes</b>	<b>P01</b>	<b>P02</b>	<b>P03</b>	<b>P04</b>	<b>PS01</b>	<b>PS02</b>	<b>PS03</b>	<b>PS04</b>	<b>PS05</b>
C01	3	2	3	1	3	3	3	2	3
C02	1	3	2	2	3	3	3	2	3
C03	3	2	3	3	3	3	3	2	3
C04	1	3	-	2	3	3	3	2	3
C05	2	3	2	1	3	3	3	2	3
C06	1	3	2	2	3	3	3	2	3
C07	-	2	1	3	3	3	3	2	3
C08	2	3	2	3	3	3	3	2	3
C09	2	3	2	2	3	3	3	2	3
C010	1	3	1	3	3	3	3	2	3

### **M.Sc 3<sup>rd</sup> Sem: Spectroscopy-III**

**C01:** To study the basic applications of infra red spectroscopy to inorganic compounds.

**C02:** To know the changes in infrared spectra of donor molecules upon coordination.

**C03:** To learn about the change in spectra accompanying change in symmetry upon coordination.

**C04:** To know the detail study of the FTIR.

**C05:** To learn about basic principle and interaction between spin and magnetic field ESR spectroscopy.

**C06:** To discuss the various factors affecting for ESR spectroscopy.

**C07:** To know the detail study of the nuclear quadrupole resonance spectroscopy.

**C08:** To study the theory, principles and experimental methods of mossbauer spectroscopy.

**COURSE : M.Sc III<sup>rd</sup> Semester ( Theory)**

**Course Code : CHGT-3.4**

**Subject: Spectroscopy-III**

<b>Course Outcomes</b>	<b>P01</b>	<b>P02</b>	<b>P03</b>	<b>P04</b>	<b>PS01</b>	<b>PS02</b>	<b>PS03</b>	<b>PS04</b>	<b>PS05</b>
C01	1	3	2	1	3	3	3	2	3
C02	2	3	3	3	3	3	3	2	3
C03	1	2	2	2	3	3	3	2	3
C04	-	2	2	3	3	3	3	2	3
C05	3	3	3	1	3	3	3	2	3
C06	3	1	2	2	3	3	3	2	3
C07	2	2	3	3	3	3	3	2	3
C08	-	1	2	2	3	3	3	2	3

## **M.Sc IV<sup>th</sup> Sem: Spectroscopy-IV**

**C01:** To know the detail study of the flame emission spectroscopy.

**C02:** To understand the basic principle, theory and flame spectra variation of emission intensity with flames, flame background, metallic spectra in flame.

**C03:** To study the applications of flame emission spectroscopy.

**C04:** To know the detail study of the chiroptical spectroscopy.

**C05:** To learn about the plane polarized light, instrumentation and optical rotary dispersion (ORD) of chiroptical spectroscopy.

**C06:** To determine the configuration of cyclic and steroidal ketones.

**C07:** To study the theoretical basics for fluorescence and phosphorescence in molecular luminescence spectroscopy.

**C08:** General scope of applications of luminescence.

**C09:** To know the detail study of the photoelectron spectroscopy.

**C010:** To learn about the X-ray photoelectron, Auger electron spectroscopy and applications.

### **COURSE : M.Sc IV<sup>th</sup> Semester ( Theory)**


**Course Code : CHGT-4.4**

**Subject: Spectroscopy-IV**

<b>Course Outcomes</b>	<b>P01</b>	<b>P02</b>	<b>P03</b>	<b>P04</b>	<b>PS01</b>	<b>PS02</b>	<b>PS03</b>	<b>PS04</b>	<b>PS05</b>
C01	1	-	3	3	3	3	3	2	3
C02	-	1	2	3	3	3	3	2	3
C03	2	3	1	3	3	3	3	2	3
C04	1	3	2	3	3	3	3	2	3
C05	2	2	2	1	3	3	3	2	3
C06	2	1	1	2	3	3	3	2	3
C07	1	2	3	3	3	3	3	2	3
C08	2	1	2	3	3	3	3	2	3
C09	2	3	1	3	3	3	3	2	3
C010	1	3	2	3	3	3	3	2	3

  
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Principal,  
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# **EVALUATION MAPPING**


## **THEORY:**

- Marks Distribution :
1. Internal Assessment = 10 marks
  2. University Examination = 40 marks

<b>Sl No</b>	<b>Parameter</b>	<b>Percentage (%)</b>
1	Knowledge	10
2	Understanding	15
3	Numericals	05
4	Descriptive	20

  
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