Department Profile:

The Department of Chemistry was started in 1981 with 5 regular faculty members. It is now one of the largest departments in the college with 7 Assistant Professors offering the following UG combinations.

» B.Sc.,

1. Mathematics, Physics, Chemistry (EM &TM)
2. Botany, Zoology, Chemistry (EM & TM)
3. Bio-technology, Microbiology, Chemistry (EM)
4. Food technology, Microbiology, Chemistry (EM)

»M.Sc., Organic Chemistry

As the importance of Chemistry was growing significantly as a subject of enormous value in the wake of tremendous development especially of the industry of medicine and the emergence of many pharmacy colleges, the department started M.Sc. Organic Chemistry in 2005.

. As the College was granted Autonomous status in 2005, the curriculum is decided by the Board of studies set up by the Academic Council of the college. The faculty of the department being members of the Board of Studies has made their contribution in bringing out the necessary changes in the curriculum to suite the changing needs of society in general and of job market in particular.

The department has 4 well-equipped laboratories – 3 for the UG and 1for the PG course. These labs have the required modern equipment - Colorimeter, Spectrophotometers, digital balances, Conductivitymeter, Potentiometers, Distilled Water Plant and a good number of ovens and suction pumps. There are two non-teaching academic and technical support staff taking care of the students and the labs.

Lab I –Inorganic Lab

Lab II –Organic Lab

Lab III –Physical Lab

Lab IV- M.Sc., Organic Lab

The Department has been adopting modern teaching methods for the past five years. To make teaching more interesting and qualitative, the modern technology including the internet, Over Head Projector is used. Regular involvement of the students in the preparation of charts on important chapters of the subject, class seminars, group discussions and subject quizzes, has enhanced their interest and inquisitiveness to learn more apart from strengthening their capacity of expression and voluntary participation.

Introduction of **"Environmental Chemistry", "Food Chemistry","Polymer Chemistry"and "Pharmaceutical and Industrial Chemistry"** as papers of study under Choice Based Inter Disciplinary Electives for B.A. and B.Com., students is a decision taken in this direction. and subject assignments for 20 marks (Internal Assessment) has also enriched the students' subject knowledge. Student enrichment programmes like guest lectures by eminent professors from the University and visits to industrial units and research laboratories have endowed them with a broader subject outlook. They have enthusiastically utilized the learning resource of the departmental library which has more than 150 volumes on Organic, Inorganic, General and Radio Chemistry.

The department has been constantly monitoring the students' academic and social behaviour. The students of every class are divided into groups and the teaching members undertake counselling for each group to clear doubts encourage and install confidence in the
students. Their performance is continuously assessed through weekly/monthly tests, internal test and remedial classes are arranged for slow learners. Besides, the faculty members are taking keen interest in personal needs and aspirations of the students. They are financially assisted to enable them to pay college and examination fees. They are also encouraged to participate in co-curricular and extra-curricular activities regularly including community service. Thus all conducive conditions are created for the students to study with devotion and determination to achieve their aims and make their dreams a reality for a bright future.

To enable the students to keep abreast of the latest trends in the field and to enhance their exposure to varied academic situations, the department conducted a seminar on

- **A two day "NATIONAL CONFERENCE ON RECENT TRENDS IN MATERIALS SCIENCES" (NCRTMS-2019) organized by SSBN Degree College(A) ATP on 9th and 10th March 2019.**
- **A two day "NATIONAL SEMINAR ON EMERGING MATERIALS AND APPICATIONS" organized by SSBN Degree College(A) ATP on 11th and 12th March 2020.**

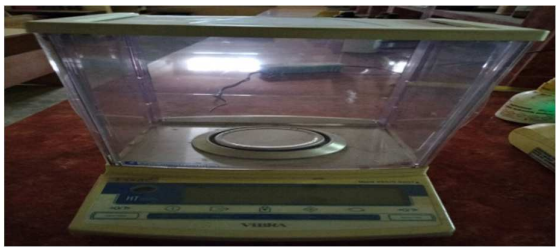
As a result of the faculty members' dedication and sustained efforts, the students were able to work hard and secured good marks. Many of them, after completing post-graduation and acquiring necessary technical and professional qualifications, are serving with responsible positions in Government and private concerns including the departments of Central Excise, Higher Education and even as software professionals in the USA.

The department has resolved to

- organize a national seminar
- strengthen the Alumni Association
- enter into MOUs with industry and reputed research institutions.

Lab Equipments:

Distilled water plant



Digital Balance

G.M Counter

OHP

Suction pump

Conductivity meter

Potentiometer

Colorimeter

Field trip

Industrial trip

Blood Grouping

Blood Donation Camp

Campus Drive

Campus drive

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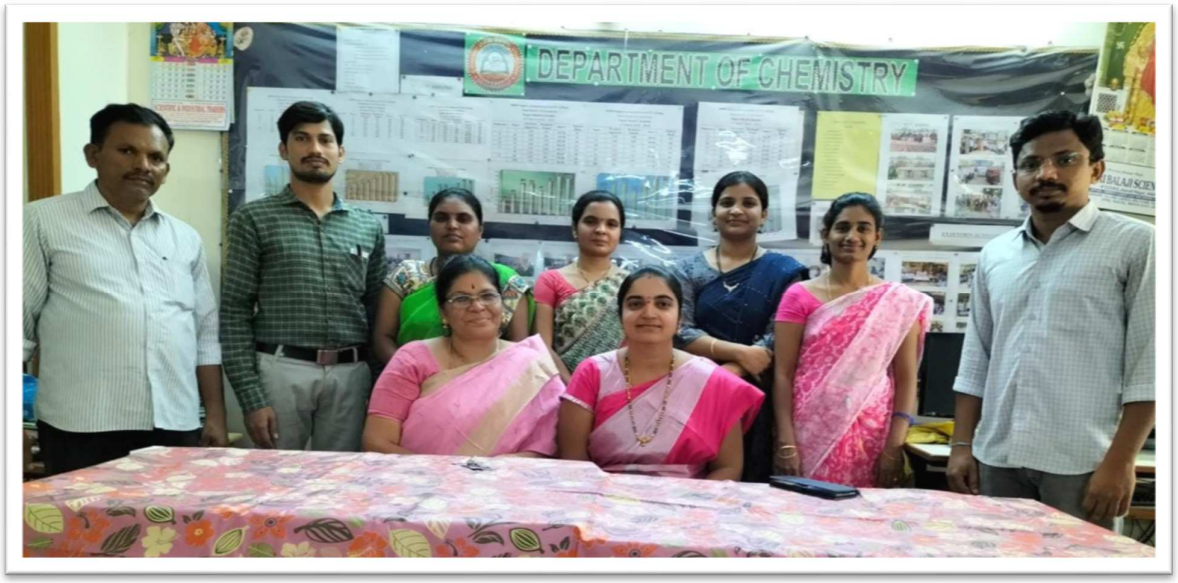
DEPARTMENT PHOTO

DEPARTMENT STAFF PHOTO



FACULTY

Dr. M. Madhusmitha **M.Sc. , Ph.D.**

Assistant Professor, Head of the department , BOS Chairman in department of chemistry and Convener ,Women empowerment cell (WEC) with more than 23 years of teaching experience, she has published research articles and papers and she has participated in National seminars, workshops and conferences. She also serves students in the capacity of in-charge of the college. She Specialized in Organic, Medicinal ,Green chemestry and Spectroscopy

CURRICULUM VITAE

Name : Dr. M. Madhusmitha
Designation : Lecturer in Chemistry
College : S.S.B.N. Degree & P.G. College,
(Autonomous) Anantapur.

ACADEMIC PROFILE

Course	Year	Class	University
B.Sc	1979-82	First	S.V. University
M.Sc.	1983-85	First	Roorkee University
Ph.D.	2008	Second	S.K.University

Teaching Experience : 23 years
Teaching Areas : Organic, Medicinal and Green Chemistry

Title of the Thesis Ph.D. : Spectrophotometric studies on Medicinal Compounds
Date of Appointment : 01-09-1999

Research Expeience :

1. Thesis on **"Some studies on Mono nuclear and Binuclear Schiff Base** Complexes submitted to Roorkee University in partial fulfilment for the Award of M.Sc. Degree.
2. Thesis on "Spectrophotometric Studies On Medicinal Compounds" submitted to S.K. University in partial fulfilment for the award of Ph.D.. degree.
3. Paper presented to the National Seminar on Modern Trends in Green Chemistry.
4. Participated in the seminar on Modern Trends in Organic Synthesis,
5. Paper "Isoflavone glycoside from Dalbergia Paniculataroots" presented at Indian
6. Chemical Society.

Academic Positions :

1. Chairmam, Board of Studies in Chemistry (U.G. & P.G.) : S.S.B.N. Degree &P.G. College.
2. Convener of WOMEN EMPOWERMENT CELL, S.S.B.N. Degree & P.G. College.

Research Publicatios:

1. NOVEL SPECTROPHOTOMETRIC METHOD FOR THE DETERMINATION OF TH(IV) USING 2,4 – DMBINH, Europeon Journal of Pharmaceutical and Medicinal Research, 2019,6(3).
2. STUDIES ON ZR(IV)-2,4- DIMETHOXYBENZALDEHYDE ISONICOTIN HYDRAZONE SYSTEM, World Journal Of Pharmaceutical Research, Volume 8, Issue 3.

International conference:

1. Participated in the International Conference on "Specialised Ayurvedic and Innovative Nutrition" organized by Sathya Sai Institute of higher learing, ATP on 16th and 17th FEB-2018.

National Conference:

1. A two day national conference on" Role of women on contemporary issues and challenges-National perspective" organized by Govt. Degree college(A) ATP on 6th and 7th FEB-2018 and presented a paper entitled "Women's Empowerment frame work".
2. A two day "NATIONAL CONFERENCE ON RECENT TRENDS IN MATERIALS SCIENCES" (NCRTMS-2019) organized by SSBN Degree College(A) ATP on 9th and 10th March 2019.

Workshops:

1. Participated in two day UGC-sponsored national workshop on "orientation to chemistry teachers on cluster electives" organized by Govt. Degree college(A) ATP on 18th and 19th JAN-2018.

2. Participated in two day UGC-sponsored national workshop on "Goods and services tax , income tax, financial markets and services(GSTIFMS-2018)" organized by SSBN Degree college(A) ATP on 29th and 30th JAN-2018.

3. Attented a two day Science Academies lecture workshop on New Vistas in Biology .Organized by Deparment of Zoology,SSBN degree college ,Anantapur on 25th and 26th July 2018.

4. **P**articipated in one day workshop on "NEXT GENERATION Of YOUNG ENTREPRENEURS" organized by AGRI BIOTECH FOUNDATION on 18th Dec, 2018.

5. Participated in UGC sponsored "BOOT CAMP ON LEADERSHIP DEVELOPMENT FOR WOMEN"organized by WOMEN EMPOWERMENT CELL-SSBN Degree College(A) during 20-21 Feb 2019.

6. Participated in the "WORSHOP ON PERSONALITY DEVELOPMENT AND WOMEN EXPOWERMENT" organized by WOMEN EMPOWERMENT CELL-SSBN Degree College(A) on 22nd Aug 2019.

7. Participated in UGC sponsored One Day "Workshop on Non-Communicable Diseases" organized by the SSBN Degree College(A),Atp on 26th Feb 2020.

8. Participated in UGC sponsored Two Day Workshop on "SELF EMPLOYMENT OPPORTUNITIES FOR WOMEN" oranized by the Women Empowerment Cell during 05-06 March 2020.

National Seminar:

1. Participated in National Seminar on"RECENT ADVANCES IN POLYMERS: DIVERSE APPLICATIONS [NSRAP-2018]" and presented a paper entitled "Conversion of Natural Fibres Adavibenda in to Nano Composite Fibers with in situ generated Silver Nano particles bya simple method" on 29th September 2018.

2. 2.Participated in UGC sponsored A Two Day National Seminar on "EMERGING TRENDS AND OPPORTUNITIES IN CHEMICAL SCIENCES AND BIOTECHNOLOGY" organized by the Department of Bio-Technology &Chemistry, Government College (A), ATP during 4th&5th January 2019.

3. Participated in UGC&APSCHE sponsored A Two Day National Seminar on "EMERGING TRENDS IN CHEMICAL & ENVIRONMENTAL SCIENCES-2020" organized by the Department of Chemistry, Government College (A), ATP during 6th& 7th Februrary 2020.

4. .Participated in UGC sponsored A Two Day "National Seminar on Emerging Materials and Applicatons" organized by the Department of Physics &Chemistry, SSBN Degree College(A), ATP held on 11th&12th March 2020.

R. Pushpalatha M.Sc. , (Ph.D).

Assistant Professor, with more than 18 years of teaching experience, she has published research articles, and papers and she has participated in National seminars, workshops and conferences. She also serves students in the capacity of in-charge of the college. She also a part of women empowerment cell (WEC). She Specialized in Organic, Physical, General and Spectroscopy

. **CURRICULUM VITAE**

Name : R. PUSHPALATHA (Ph.D.)

Designation : Lecturer in Chemistry

College : S.S.B.N. Degree & P.G. College, (Autonomous) Anantapuramu.

Educational Qualifications :

Couree	Year	Class	University
B.Sc	1999-2002	First	S.K.University
M.Sc.	2002-2024	First	S.K.University

Date of Appointment : 16-07-2004

Teaching Areas : Organic, Physical and General and Spectroscopy

Teaching Experience : 18 years

Academic Positions :

1. Member, Board of Studies in Chemistry (U.G. & P.G.) : S.S.B.N. Degree &P.G. College.
2. Member of WOMEN EMPOWERMENT CELL, S.S.B.N. Degree & P.G. College.

Research Publicatios:

1. Nano composite polyester fabrics with in situ generated silver nano particles using tamarind leaf extract reducing agent.,International Journal of Polymer Analysis and Characterization..
2. Antibacterial polyester fabrics with in situ generated copper and cuprous oxide nanaoparticles by biodirection method,Inorganic and Nano-Metal Chemistry.

International Conference:

- Participated in the International Conference on "Specialised Ayurvedic and Innovative Nutrition" organized by Sathya Sai Institute of higher learing, ATP on 16th and 17th FEB-2018.

National Conference:

1. A two day national conference on" Role of women on contemporary issues and challenges-National perspective" organized by Govt. Degree college(A) ATP on 6th and 7th FEB-2018 and presented a paper entitled "Women's Empowerment frame work".
2. A two day "NATIONAL CONFERENCE ON RECENT TRENDS IN MATERIALS SCIENCES" (NCRTMS-2019) organized by SSBN Degree College(A) ATP on 9th and 10th March 2019 and presented a paper entitled "Photosynthetic fibres for faster wound closure".

Workshops:

1. Participated in two day UGC-sponsored national workshop on "orientation to chemistry teachers on cluster electives" organized by Govt. Degree college(A) ATP on 18th and 19th JAN-2018.
2. Participated in two day UGC-sponsored national workshop on "Goods and services tax , income tax, financial markets and services(GSTIFMS-2018)" organized by SSBN Degree college(A) ATP on 29th and 30th JAN-2018.
3. Attented a two day Science Academies lecture workshop on New Vistas in Biology .Organized by Deparment of Zoology,SSBN degree college ,Anantapur on 25th and 26th July 2018.
4. Participated in one day workshop on "NEXT GENERATION Of YOUNG ENTREPRENEURS" organized by AGRI BIOTECH FOUNDATION on 18th Dec, 2018.
5. Participated in UGC sponsored "BOOT CAMP ON LEADERSHIP DEVELOPMENT FOR WOMEN"organized by WOMEN EMPOWERMENT CELL-SSBN Degree College(A) during 20-21 Feb 2019.
6. Participated in the "WORSHOP ON PERSONALITY DEVELOPMENT AND WOMEN EXPOWERMENT" organized by WOMEN EMPOWERMENT CELL-SSBN Degree College(A) on 22nd Aug 2019.
7. Participated in UGC sponsored One Day "Workshop onNon-Communicable Diseases" organized by the SSBN Degree College(A),Atp on 26th Feb 2020.

8. Participated in UGC sponsored Two Day Workshop on "SELF EMPLOYMENT OPPORTUNITIES FOR WOMEN" oranized by the Women Empowerment Cell during 05-06 March 2020.

National Seminar:

1. Participated in National Seminar on"RECENT ADVANCES IN POLYMERS: DIVERSE APPLICATIONS [NSRAP-2018]" and presented a paper entitled "Conversion of Natural Fibres Adavibenda in to Nano
2. Participated in UGC sponsored A Two Day National Seminar on "EMERGING TRENDS AND OPPORTUNITIES IN CHEMICAL SCIENCES AND BIOTECHNOLOGY" organized by the Department of Bio-Technology &Chemistry, Government College (A), ATP during 4th&5th January 2019.
3. Participated in UGC&APSCHE sponsored A Two Day National Seminar on "EMERGING TRENDS IN CHEMICAL & ENVIRONMENTAL SCIENCES-2020" organized by the Department of Chemistry, Government College (A), ATP during 6th& 7th Februrary 2020.
4. Participated in UGC sponsored A Two Day "National Seminar on Emerging Materials and Applicatons" organized by the Department of Physics &Chemistry, SSBN Degree College(A), ATP held on 11th&12th March 2020.

Sri. M. SURENDRA M.Sc., AP-SET

Assistant professor, with more than 6 years of teaching experience, participated in National workshops, webinars and conferences. He also serves the college at blood camps, blood donation camps, placement drives and students in the capacity of in-charge of the college. Specialization in Organic, Inorganic ,Physical, Medicinal and Spectroscopy. He is the member in the Invitation Committee and Career Development Cell.

CURRICULUM VITAE

Name : M.Surendra

Designation : Lecturer in Chemistry

College : S.S.B.N. Degree & P.G. College (Autonomous) Anantapuramu.

Educational Qualifications:

Course	Year	Class	University
B.Sc	2008-2011	First	S.K.University
M.Sc.	2012-2014	First	S.K.University

Date of Appointment : 19-07-2016

Teaching Areas : Organic, Inorganic, Physical, Medicinal, General Chemistry and Spectroscopy.

Teaching Experience : 6 years

Academic Position : Member in B.O.S and Career Development Cell.

National Conference:

- Participated A two day "NATIONAL CONFERENCE ON RECENT TRENDS IN MATERIALS SCIENCES" (NCRTMS-2019) organized by SSBN Degree College(A) ATP on 9th and 10th March 2019

Workshops:

1. Participated in two day UGC-sponsored national workshop on "orientation to chemistry teachers on cluster electives" organized by Govt. Degree college(A) ATP on 18th and 19th JAN-2018.
2. Participated in two day UGC-sponsored national workshop on "Goods and services tax , income tax, financial markets and services(GSTIFMS-2018)" organized by SSBN Degree college(A) ATP on 29th and 30th JAN-2018.
3. Attented a two day Science Academies lecture workshop on New Vistas in Biology .Organized by Department of Zoology, SSBN degree college ,Anantapur on 25th and 26th July 2018.
4. Participated in one day workshop on "NEXT GENERATION Of YOUNG ENTREPRENEURS" organized by AGRI BIOTECH FOUNDATION on 18th Dec, 2018.
5. Participated in one day workshop on "Non Communicable Diseases" organized by Red Ribbon Club, SSBN Degree College, on 26th feb 2020.

National Seminar:

1. Participated in two day UGC-sponsored national seminar organized by the Department of Sanskrit, Hindi and Telugu ,SSBN Degree college(A) ATP on 14th and 15th March-2018.
2. Participated in UGC sponsored A Two Day National Seminar on "EMERGING TRENDS AND OPPORTUNITIES IN CHEMICAL SCIENCES AND BIOTECHNOLOGY" organized by the Department of Bio-Technology &Chemistry, Government College (A), ATP during 4th&5th January 2019.
3. Participated as a delegate in All India Council for Technical Education (AICTE) Sponsored a two week faculty Development Programme on "New insights to Advance in Drug Discovery for the Treatment of Resistant Infectious Diseases" Organized by Dept of Pharmaceutical Chemistry , RIPER . during 15th July -27th July 2019.
4. Participated in UGC sponsored A Two Day "National Seminar on Emerging Materials and Applicatons" organized by the Department of Physics &Chemistry, SSBN Degree College(A), ATP held on 11th&12th March 2020.

5. Participated in UGC sponsored A One Day "National Seminar on New Paradigm Shifts in Drug Discovery and Biopharmaceuticals of 21st Century" organized by the SSBN Degree College(A), ATP held on 14th March 2020.

Additional Activities:

1. Participated in Blood grouping programme held on 30th July 2018 in Our College Campus.
2. Participated in Blood Donation Camp held on 07th Dec 2018 in Our College Campus.
3. Participated as a jury member for the District Science Exhibition -2018 in Dharmavaram held on 15th Dec-2018.
4. Participated in Awareness Programme on Personality Development and Goal Setting in our college on 23-Jan -2019.
5. Participated in Brainz 2K19 use your Brain like as app in RIPER College on 6th -Feb -2019.
6. Participated in Educational trip Raghavendra Institute of Pharmaceutical College, Anantapur.
7. Organized and Attended A Pool Campus Drive Conducted by Divis Laboratories Hyderabad in Raghavendra Institute of Pharmacy held on 15th Feb 2018.
8. Organized Placement Drive for all Final Year Students Conducted by Hiremee Solutions, Bangalore in SSBN Degree College held on 23th Feb 2019.
9. Went to Industrial trip with Students on 14th July 2019.
10. Organized A Campus Drive for Both UG and PG final Year Students Conducted by Divis Laboratories Hyderabad in SSBN Degree And PG College , Anantapur held on 20th July 2019.
11. Participated in Blood grouping programme held on 30th Aug 2019 in Our College Campus.
12. Attended District Wise Cultural Compition with the Students for National Youth day 12th Jan 2020 Organized by Department of Youth Services, Govt. of Andhra Pradesh.
13. Organized a Campus Drive for Both UG and PG final Year Students Conducted by G.V.K Bio Sciences Pvt. Ltd. Hyderabad in SSBN Degree And PG College , Anantapur held on 31st Jan 2020.
14. Participated in Blood grouping and Blood Donation Camp held on 13th Feb 2020 in Our College Campus.
15. Organized A Campus Drive for Both UG and PG final Year Students Conducted by Divis Laboratories Hyderabad in SSBN Degree And PG College , Anantapur held on 25th Feb 2020.

Smt. G RESHMA M.Sc., B.Ed..

Assistant Professor, with more than 6 years of teaching experience, she has participated in National seminars, workshops, webinars and conferences. She serves the college at Blood Groping Camps, Blood Donation Camps, Placement Drives and students in the capacity of in-charge of the college. She also a part of women empowerment cell (WEC). She Specialized in Organic, Physical, Environmental, Medicinal and Drug design.

CURRICULUM VITAE

Name : Smt.G Reshma

Designation : Lecturer

Research Interests : Medicinal Chemistry

Education :

- B.Ed. from Sai Ram Vidyaniketan College of Education, Sri Krishnadevaraya University Anantapur, AP during the year 2014.
- M.Sc (Organic Chemistry) from Govt. Arts College, Sri Krishnadevaraya University, Anantapur, A.P during the academic year 2011-2013.

Teaching Areas : Organic, Medicinal and Drug-design

Technical Qualification : M.S Office.

Teaching Experience : 6 years

Academic Positions :

1. Member, Board of Studies in Chemistry (U.G. & P.G.) : S.S.B.N. Degree &P.GCollege.
2. Member of WOMEN EMPOWERMENT CELL, S.S.B.N. Degree & P.G. College.

Seminars/workshops/ Conference Participation:

1. G RESHMA (2018), " Role of Women in Rural Development", National Seminar on Role of Women on Contemporary Issues and Challenges – National Perspective, Government College (Autonomous) Anantapuramu, AP on 6th and 7th February, 2018.

2. G RESHMA (2019), "Trands In Nano Materials", National Conference on Recent Trends in Materials Science (NCRTMS - 2019), at SSBN Degree College, Anantapur on 9th and 10th March, 2019.
3. G RESHMA (2020), "Self Employment Opportunities for Women", at SSBN Degree College, Anantapur on 6th March, 2020.
4. G RESHMA (2019), " Workshop on Personality Development and Women Empowerment", at SSBN Degree College, Anantapur on 22nd August, 2019.
5. G RESHMA (2019), " Boot Camp on Leadership Development for Women", at SSBN Degree College, Anantapur on 21st February, 2019.
6. G RESHMA (2018), " Next Generation of Young Entrepreneurs" at AGRI Biotech Foundation on 18th December, 2018
7. G RESHMA (2018), " New Vistas in Biology" Joint Science Education Panel sponsored Lecturer Workshop ", at SSBN Degree College, Anantapur on 25th and 26th July, 2018.

Smt. E.Lakshmi **M.Sc., B.Ed..(Ph.D),AP-SET**

Assistant Professor, with more than 10 years of teaching experience, she has published research articles,and papers and she has participated in National seminars, workshops and conferences. She also serves students in the capacity of in-charge of the college. She also a part of women empowerment cell (WEC). She Specialized in Organic, Physical, polymer, Inorganic and Spectroscopy.

CURRICULUM VITAE

Name : E. Lakshmi

Designation : Lecturer in Chemistry

College : S.S.B.N. Degree & P.G. College,
(Autonomous) Anantapur.

Teaching Areas : Inorganic, Organic, Physical Chemistry and Spectra

Education & Qualification :

Bachelor of Education : **2013**
Jnana Bharathi College of education (B.Ed.), Kalyandurgam.

Master of Science : **Organic Chemistry (2009-2011)**
Dr Rama Linga Reddy PG College, Allagadda, Kurnool District,
Sri Krishnadevaraya University, Ananthapuramu.

Bachelor of Science : **2004-2007**
Arts College, Ananthapuramu
Sri Krishnadevaraya University, Ananthpuramu

Intermediate : **2004**
PR REDDY Junior College, Ananthapuramu

SSC : **2000**
Zilla Parishad high School, Atmakur (P & M), Ananthapuramu (D)

Title of the Thesis : Investigations on transition metal complexes of nicotinoyl and isonicotinoyl hydrazones

Ph.D. : Ph. D (Inorganic Chemistry)

Date of Appointment: 01-12-2011

Teaching Experience:

- Assistant Professor in Chemistry at SSBN Degree and PG College, Ananthapuramu 2011 till date.

Academic Positions :

1. Member, Board of Studies in Chemistry (U.G. & P.G.) : S.S.B.N. Degree &P.GCollege.
2. Member of WOMEN EMPOWERMENT CELL, S.S.B.N. Degree & P.G. College.

Research Skills :

- DFT studies
- Antibacterial studies
- Analysis of ESR and Cyclic voltammetry spectrum
- Handling of UV-visible spectrophotometer

List of Published Papers

1. "Synthesis, Spectral Studies and Antibacterial Studies of Transition Metal Complexes of Nicotinoyl Hydrazone" E. Lakshmi, A. Suseelamma, M. Sandhya Rani, G.Ramanjaneyulu and P. Raveendra Reddy* Journal of Emerging Technologies and Innovative Research, Vol. 5, (2018), 749-756.

2. Synthesis, Spectral Characterization and Antibacterial Activity of Metal Complexes of 2-Methoxy benzaldehyde isonicotinoyl hydrazone E. Lakshmi, T. Krishna, A. Suseelamma and P. Raveendra Reddy, International Journal of Science and Research (IJSR) ISSN: 2319-7064, SJIF (2019), Volume 10 Issue 1, January 2021.

3. "Synthesis, Spectral Characterization and Antibacterial Activity of Iron(II) Complexes of Isonicotinoyl hydrazones", E.LAKSHMI, P. Raveendra Reddy* and A. Suseelamma, European Journal of Biomedical and Pharmaceutical Sciences, Vol.9,(2022)

International conference:

1. Participated in the International Conference on "Chemistry for Sustainable Future" organized by the Department of Integrated Chemistry, Palamuru University during 7th to 9th August,2018.

2. “Synthesis, Characterization, DNA binding and Nuclease activity of iron(III) complexes of Isonicotinoyl Hydrazones” International Conference on State Knowledge of Chemistry in Industry and Environment, Department of Chemistry, S.V.R.M. College, Nagaram, held on 22nd to 24th, June 2018.

3. Synthesis, Spectral studies, DNA binding and nuclease activity of Fe(III) complexes of isonicotinoyl hydrazones” International Conference on Chemistry for Sustainable Future, Department of Integrated chemistry, Palamuru University, Mahabubnagar, held on 7 th to 09th, August, 2018

National Seminar:

1. “Synthesis, Characterization of copper complexes of Hydrazones” Presented at National Symposium RACPS-2017, Department of Chemistry, S.V.G.M. Govt. Degree College, Kalyandurgum, held on 7th, October 2017.
2. Participated in the National Seminar on “Recent Developments in Applied Microbiology and Biochemistry “organized by the Department of Microbiology during 30th & 31st May, 2018.
3. Participated a two-day Science Academies in the National Seminar on “New Vistas in Biology” on 25th and 26th July 2018.
4. Participated a two day in the Boot Camp on Leadership Development for Women organized by the Women Empowerment Cell during 20-21 February 2019.

Workshops:

1. Participated in the one-day workshop on “Next Generation of Young Entrepreneurs” held at Sri Sai Baba National Degree College, Anantapur-515001, Andhra Pradesh during 18th December, 2018.
2. Participated in two-day UGC-sponsored national workshop on “Goods and services tax, income tax, financial markets and services (GSTIFMS-2018)” organized by SSBN Degree college(A) ATP on 29th and 30th JAN-2018.
3. Attended a two-day Science Academies lecture workshop on New Vistas in Biology. Organized by Department of Zoology, SSBN degree college, Anantapur on 25th and 26th July 2018

Dr. K.AnujaM.Sc., B.Ed..(Ph.D),NET,AP-SET.

Assistant Professor, with more than 6 years of teaching experience, she has published research articles,and papers and she has participated in National seminars, workshops and conferences. She also serves students in the capacity of in-charge of the college. She also a part of women empowerment cell (WEC). She Specialized in Organic, Physical, polymer, Inorganic, Environmental and Spectroscopy.

CURRICULUM VITAE

Name : Dr.K,ANUJA

Designation : Lecturer in Chemistry

College : S.S.B.N. Degree & P.G. College,

(Autonomous) Anantapur.

Teaching Areas : Organic, Physical and Environmental Chemistry

Educational Qualifications:

Couree	Year	Class	University
B.Sc	2009	First	S.K.University
M.Sc.	2011	First	S.K.University
B.Ed,	2013	Second	S.K.University
Ph.D.	2021	First	S.K.University

Title of the Thesis:

Ph.D. : ***''STUDIES ON STRUCTURAL CHARACTRIZATION AND BIOLOGICAL APPLICATIONS OF METALLO-AZOMETHINES''***

Date of Appointment : 01-07-2013

Teaching Experience : 06 years

Research Skills :

DNA binding studies

Antibacterial studies

Analysis of ESR and Cyclic voltammetry spectrum

Handling of UV-visible spectrophotometer

Academic Positions :

1. Member, Board of Studies in Chemistry (U.G. & P.G.) : S.S.B.N. Degree &P.GCollege.
2. Member of WOMEN EMPOWERMENT CELL, S.S.B.N. Degree & P.G. College.

Achievements :

1. **Qualified National Eligibility Test CSIR-UGC-NET (LECTURERSHIP)-2011 in Chemical Sciences.**
2. **Qualified APSET-2018 in Chemical Sciences.**

Research Publicatios:

1. Structural Characterisation DNA Binding and Antebacterial Studies of Transition metal complexes with 2-formylpyridine acetoylhydrazone (FPAH): X-Ray Structure determination of $Co(FPAH)_2Cl.\ 2H_2O$ Complex,**RESEARCH JOURNAL OF CHEMISTRY AND ENVIRONMENT,UGC Approved Journal Vol. 25, April (2021)180-190.**

2. Synthesis, structural characterization and DNA binding studies on Transition Metal complexes with 2-formylpyridine benzoylhydrazone, **ASIAN JOURNAL OF CHEMISTRY, UGC Approved JournalVol, 32, No. 2(2020)322-328.**

3. DNA Binding and Antibacterial activity of Transition metal Complexes with Pre-organised hexadentate ligand.**INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH,UGC** ***Approved Journal, 2022*****, Vol. 13(2). Accepted for publication.**

PAPERS PRESENTED IN NATIONAL SEMINARS

1. Paper entitled "**Structural Characterisation DNA Binding and Antebacterial Studies of Transition metal complexes with 2-formylpyridine acetoylhydrazone (FPAH): X-Ray Structure determination of $Co(FPAH)_2Cl.\ 2H_2O$ Complex"** A TWO-DAY UGC & APSCHE SPONSORED NATIONAL SEMINAR ON EMERGING TRENDS AND OPPORTUNITIES IN CHEMICAL AND ENVIRONMENTAL SCIENCESOrganised by Department of Chemistry, Govt.College (A), Ananthapuramu during 6^{th} and 7^{th} February, 2020.
2. Paper entitled "**Synthesis, structural characterization and DNA binding studies on Transition Metal complexes with 2-formylpyridine benzoylhydrazone"**A TWO-DAY NATIONAL SEMINAR ON EMERGING TRENDS AND OPPORTUNITIES IN CHEMICAL SCIENCES AND BIOTECHNOLOGYorganised by Department of Biotechnology and Chemistry, Govt.College (A), Ananthapuramu during 4^{th} and 5^{th} January, 2019.

Workshops:

1. Participated in UGC sponsored "BOOT CAMP ON LEADERSHIP DEVELOPMENT FOR WOMEN"organized by WOMEN EMPOWERMENT CELL-SSBN Degree College(A) during 20-21 Feb 2019.
2. Participated in the "WORSHOP ON PERSONALITY DEVELOPMENT AND WOMEN EXPOWERMENT" organized by WOMEN EMPOWERMENT CELL-SSBN Degree College(A) on 22^{nd} Aug 2019.

National Seminar:

1. A two day "NATIONAL CONFERENCE ON RECENT TRENDS IN MATERIALS SCIENCES" (NCRTMS-2019) organized by SSBN Degree College(A) ATP on 9th and 10th March 2019 and presented a paper entitled "Photosynthetic fibres for faster wound closure".
2. Participated in UGC sponsored A Two Day "National Seminar on Emerging Materials and Applicatons" organized by the Department of Physics &Chemistry, SSBN Degree College(A), ATP held on 11th&12th March 2020.

Smt. B Sai Eeswari M.Sc

Assistant Professor, with 5 years of teaching experience, she has participated in National seminars, workshops and conferences. She also serves students in the capacity of in-charge of the college. She also a part of women empowerment cell (WEC). She Specialized in Organic, Physical, polymer, Inorganic and Spectroscopy.

CURRICULUM VITAE

Name	:	Smt. B Sai Eeswari
Designation	:	Lecturer
Teaching Areas	:	General and Inorganic Chemistry
Research Interests	:	Inorganic Chemistry
Education	:	M.Sc. (Organic Chemistry) From SSBN Degree And PG College (2013 – 2015)
Teaching Experience	:	4 years

Academic Positions :

1. Member, Board of Studies in Chemistry (U.G. & P.G.) : S.S.B.N. Degree &P.GCollege.
2. Member of WOMEN EMPOWERMENT CELL, S.S.B.N. Degree & P.G. College.

Seminars/ Conference Participation:

- B Sai Eeswari (2020), "Self-Employment Opportunities for Women", at SSBN Degree College, Anantapur on 5th and 6th March 2020.
- B Sai Eeswari (2019), "Workshop on Personality Development and Women Empowerment", at

SSBN Degree College, Anantapur on 22nd August 2019.

- B Sai Eeswari (2019), "Trends in Nano Materials", National Conference on Recent Trends in Materials Science (NCRTMS - 2019), at SSBN Degree College, Anantapur on 9th and 10th March 2019.
- B Sai Eeswari (2019), "Boot Camp on Leadership Development for Women", at SSBN Degree College, Anantapur on 21st February 2019.
- B Sai Eeswari (2018), "Next Generation of Young Entrepreneurs" at AGRI Biotech Foundation on 18th December 2018.
- B Sai Eeswari (2018), "New Vistas in Biology" Joint Science Education Panel sponsored Lecturer Workshop", at SSBN Degree College, Anantapur on 25th and 26th July 2018.

Non Teaching Staff

Sri. U. Chinnikrishna	Sri. U. Sukumar
	

CURRICULUM

B.Sc., CHEMISTRTY COURSE SYLLABUS UNDER CBCS

Year	Semester	Course	Title of the course	Marks	No. of hours per week	No. of credits
I	I	I	Inorganic and Physical Chemistry	100	4	3
			Practical – I Analysis of S Salt mixture	50	2	2
	II	II	Organic and General Chemistry	100	4	3
			Practical – IIVolumetric Analysis	50	2	2
II	III	III	Organic Chemistry and Spectroscopy	100	4	3
			Practical – IIVolumetric Analysis	50	2	2
	IV	IV	Inorganic, Organic and Physical Chemistry	100	4	3
			Practical – IV Organic Qualitative analysis	50	2	2
		V	Inorganic and Physical Chemistry	100	4	3
			Practical-V Course Conductometric and Potentiometric Titrimetry	50	2	2

SKILL DEVELOPMENT COURSES (SDC)

Year	Semester	Title of the course	No. of hours per week	MARKS			No. of credits
				External	Internal	Total	
I	I	Environmental Chemistry	2	30	20	50	2
I	II	Food Chemistry	2	30	20	50	2
II	III	Polymer Chemistry	2	30	20	50	2
II	III	Pearmaceutical & Indutrial Chemistry	2	30	20	50	2

Course outcomes:

At the end of the course, the student will be able to;

- Understand the basic concepts of p-block elements
- Explain the difference between solid, liquid and gases in terms of intermolecular interactions
- Apply the concepts of gas equations, pH and electrolytes while studying other chemistry courses.

INORGANIC CHEMISTRY **24 h**

UNIT –I

Chemistry of p-block elements **8h**

Group 13: Preparation & structure of Diborane, Borazine

Group 14: Preparation, classification and uses of silicones

Group 15: Preparation & structures of Phosphonitrilic halides $\{(PNCl_2)_n$ where n=3, 4

Group 16: Oxides and Oxoacids of Sulphur (structures only)

Group 17: Pseudohalogens, Structures of Interhalogen compounds.

UNIT-II

Chemistry of d-block elements: **6h**

Characteristics of d-block elements with special reference to electronic configuration, variable valence, magnetic properties, catalytic properties and ability to form complexes. Stability of various oxidation states.

Chemistry of f-block elements: **6h**

Chemistry of lanthanides - electronic structure, oxidation states, lanthanide contraction, consequences of lanthanide contraction, magnetic properties. Chemistry of actinides - electronic configuration, oxidation states, actinide contraction, comparison of lanthanides and actinides.

Theories of bonding in metals: **4h**

Valence bond theory and Free electron theory, explanation of thermal and electrical conductivity of metals based on these theories, Band theory- formation of bands, explanation of conductors, semiconductors and insulators.

PHYSICAL CHEMISTRY **36h**

UNIT-III

Solid state **10h**

Symmetry in crystals. Law of constancy of interfacial angles. The law of rationality of indices. The law of symmetry. Miller indices, Definition of lattice point, space lattice, unit cell. Bravais lattices and crystal systems. X-ray diffraction and crystal structure. Bragg's law. Powder method. Defects in crystals. Stoichiometric and non-stoichiometric defects.

UNIT-IV

Gaseous state **6h**

van der Waal's equation of state. Andrew's isotherms of carbon dioxide, continuity of state. Critical phenomena. Relationship between critical constants and vander Waal's constants.

Lawof corresponding states. Joule- Thomson effect. Inversion temperature.

Liquid state **4h**

Liquid crystals,mesomorphicstate. Differences between liquid crystal and solid/liquid. Classification of liquid crystals into Smectic and Nematic. Application of liquid crystals as LCD devices

UNIT-V

Solutions & dilute solutions

Solutions **6h**

Azeotropes-HCl-H_2O system and ethanol-water system. Partially miscible liquids-phenol-water system. Critical solution temperature (CST), Effect of impurity on consulate temperature. Immiscible liquids and steam distillation.Nernst distribution law. Calculation of the partition coefficient. Applications of distribution law.

Dilute solutions **7h**

Colligative properties- RLVP, Osmotic pressure, Elevation in boing point and depression in freezing point. Experimental methods for the determination of molar mass of a non-volatile

Reference Books:

1. Principles of physical chemistry by Prutton and Marron
2. Solid State Chemistry and its applications by Anthony R. West
3. Text book of physical chemistry by K L Kapoor
4. Text book of physical chemistry by S Glasstone
5. Advanced physical chemistry by Bahl and Tuli
6. Inorganic Chemistry by J.E.Huheey
7. Basic Inorganic Chemistry by Cotton and Wilkinson
8. A textbook of qualitative inorganic analysis by A.I. Vogel
9. Atkins,P.W.&Paula,J.deAtkin'sPhysicalChemistryEd.,OxfordUniversityPress 10thEd(2014).
10. Castellan,G.W.PhysicalChemistry4thEd.Narosa(2004).
11. Mortimer,R. G.PhysicalChemistry3rdEd. Elsevier:NOIDA,UP(2009).
12. Barrow,G.M.PhysicalChemistry

LABORATORY COURSE -I

Practical-I Analysis of Salt Mixture

(At the end of Semester-I)

30hrs (2 h / w) **50 M**

Qualitative inorganic analysis (Minimum of Six mixtures should be analyzed)

Course outcomes:

At the end of the course, the student will be able to;

1. Understand the basic concepts of qualitative analysis of inorganic mixture
2. Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
3. Apply the concepts of common ion effect, solubility product and concepts related to qualitative analysis

Analysis of SALT MIXTURE **50 M**

Analysis of mixture salt containing two anions and two cations (From two different groups) from the following:

Anions: Carbonate, Sulphate, Chloride, Bromide, Acetate, Nitrate, Borate, Phosphate.

Cations: Lead, Copper, Iron, Aluminium, Zinc, Nickel, Manganese, Calcium, Strontium, Barium, Potassium and Ammonium

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Course outcomes:

At the end of the course, the student will be able to;

- Understand and explain the differential behavior of organic compounds based on fundamental concepts learnt.
- Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.
- Learn and identify many organic reaction mechanisms including Free Radical Substitution, Electrophilic Addition and Electrophilic Aromatic Substitution.
- Correlate and describe the stereochemical properties of organic compounds and reactions.

ORGANIC CHEMISTRY **36h**

UNIT-I

Recapitulation of Basics of Organic Chemistry

Carbon-Carbon sigma bonds (Alkanes and Cycloalkanes) 12h General methods of preparation of alkanes- Wurtz and WurtzFittig reaction, Corey House synthesis, physical and chemical properties of alkanes, Isomerism and its effect on properties, Free radical substitutions; Halogenation, concept of relative reactivity v/s selectivity. Conformational analysis of alkanes (Conformations, relative stability and energy diagrams of Ethane, Propane and butane).General molecular formulae of cycloalkanes and relative stability, Baeyer strain theory, Cyclohexane conformations with energy diagram, Conformations of monosubstituted cyclohexane

UNIT-II

Carbon-CarbonpiBonds(AlkenesandAlkynes) 12h General methods of preparation, physical and chemical properties. Mechanism of E1,E2, E1cb reactions, Saytzeff and Hoffmann eliminations, Electrophilic Additions, mechanism (Markownikoff/Antimarkownikoff addition) with suitable examples,, synandanti-addition; addition of H2,X2, HX. oxymercuration-demercuration, hydroboration- oxidation, ozonolysis, hydroxylation, Diels Alderreaction,1,2- and1,4-additionreactionsinconjugateddienes.

Reactions of alkynes; acidity, electrophilic and nucleophilic additions, hydration to form carbonyl compounds, Alkylation of terminal alkynes

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UNIT-III

Benzene and its reactivity **12h**

Concept of aromaticity, Huckel's rule - application to Benzenoid (Benzene, Naphthalene) and Non - Benzenoid compounds (cyclopropenylcation, cyclopentadienyl anion and tropyliumcation)

Reactions - General mechanism of electrophilic aromatic substitution, mechanism of nitration, Friedel- Craft's alkylation and acylation. Orientation of aromatic substitution - ortho, para and meta directing groups. Ring activating and deactivating groups with examples (Electronic interpretation of various groups like NO2 and Phenolic). Orientation of (i) Amino, methoxy and methyl groups (ii) Carboxy, nitro, nitrile, carbonyl and sulphonic acid groups

(ii) Halogens (Explanation by taking minimum of one example from each type)

GENERAL CHEMISTRY **24 h**

UNIT-IV

1. **Surface chemistry and chemical bonding**

Surface chemistry **6h**

Colloids- Coagulation of colloids- Hardy-Schulze rule. Stability of colloids Protection of Colloids, Gold number

Adsorption-Physical and chemical adsorption, Langmuir adsorption isotherm, applications of adsorption

2. **Chemical Bonding** **6h**

Valence bond theory, hybridization, VB theory as applied toClF_3**,**$Ni(CO)_4$**,** Molecular orbital theory -LCAO method, construction of M.O. diagrams for homo-nuclear and hetero-nuclear diatomic molecules (N_2, O_2, CO and NO).

3. **HSAB 2h**

Pearson's concept, HSAB principle & its importance, bonding in Hard-Hard and Soft-Soft combinations.

UNIT-V

Stereochemistry of carbon compounds **10h**

Molecular representations- Wedge, Fischer, Newman and Saw-Horse formulae

Optical isomerism: Optical activity- wave nature of light, plane polarised light, optical rotation and specific rotation.

Chiral molecules- definition and criteria(Symmetry elements)- Definition of enantiomers and diastereomers – Explanation of optical isomerism with examples- Glyceraldehyde, Lactic acid, Alanine, Tartaric acid, 2,3-dibromopentane.

D,L, R,S and E,Z- configuration with examples.

Definition of Racemic mixture – Resolution of racemic mixtures (any 3 techniques)

Reference Books :

Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (PearsonEducation).

Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).

Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).

Eliel, E. L. &Wilen, S. H. Stereochemistry of Organic Compounds; Wiley: London, 1994. Kalsi, P. S. Stereochemistry Conformation and Mechanism; New Age International, 2005.

LABORATORY COURSE -II

Practical-II Volumetric analysis

(At the end of Semester-II)

30hrs (2 h / w) **50 M**

Course outcomes:

At the end of the course, the student will be able to;

- Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
- Understand and explain the volumetric analysis based on fundamental concepts learnt in ionic equilibria.
- Learn and identify the concepts of a standard solutions, primary and secondary standards
- Facilitate the learner to make solutions of various molar concentrations. This may include: The concept of the mole; Converting moles to grams; Converting grams to moles; Defining concentration; Dilution of Solutions; Making different molar concentrations.

Volumetric analysis **50 M**

1. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.
2. Determination of Fe (II) using KMnO4 with oxalic acid as primary standard.
3. Determination of Cu (II) using Na2S2O3 with K2Cr2O7 as primary standard.
4. Estimation of water of crystallization in Mohr's salt by titrating with KMnO4

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Course outcomes:

At the end of the course, the student will be able to;

- Understand preparation, properties and reactions of haloalkanes, haloarenes and oxygen containing functional groups.
- Use the synthetic chemistry learnt in this course to do functional group transformations.
- To propose plausible mechanisms for any relevant reaction.

ORGANIC CHEMISTRY **34h**

UNIT – I

1. Chemistry of Halogenated Hydrocarbon **6h** Alkyl halides: Methods of preparation and properties, nucleophilic substitution reactions– SN1,SN2 and SNi mechanisms with stereochemical aspects and effect of solvent etc.; nucleophilic substitutions. elimination, Williamson's synthesis. Arylhalides: Preparation (includingpreparationfromdiazoniumsalts) and properties, nucleophilic aromatic substitution; SNAr, Benzyne mechanism.

Relative reactivity of alkyl, allyl, benzyl, vinyl and aryl halides towards nucleophilic substitution reactions.

2. Alcohols &Phenols **6h**

Alcohols: preparation, properties and relative reactivity of 1°, 2°, 3° alcohols, Bouvaelt Blanc Reduction; Oxidation of diols by periodic acid and lead tetra acetate, Pinacol- Pinacolone rearrangement;

Phenols: Preparation and properties; Acidity and factors effecting it, Ring substitution reactions, Reimer–Tiemann and Kolbe's–Schmidt Reactions, Fries and Claisenre arrangements with mechanism.

UNIT-II

CarbonylCompounds **10h**

Structure, reactivity, preparation and properties; Nucleophilicadditions,Nucleophilic addition-eliminationreactionswithammoniaderivatives

Mechanisms of Aldol and Benzoin condensation, Claisan-Schmidt, Perkin, Cannizzaro and Wittig reaction, Beckmann halo form reaction and Baeyer Villiger oxidation, α- substitution reactions, oxidations and reductions(Clemmensen, wolf –kishner, with LiAlH4 &NaBH4).

Addition reactions of α,β-unsaturated carbonyl compounds: Michaeladdition. Active methylene compounds: Keto-

enoltautomerism. Preparation and synthetic applications of diethyl malonateandethyl acetoacetate.

UNIT-III

Carboxylic Acids and their Derivatives **12h**

General methods of preparation, physical properties and reactions of monocarboxylic acids, effect of substituentsonacidicstrength.Typicalreactionsofdicarboxylicacids,hydroxyacidsandunsaturat edacids.

Preparationandreactionsofacidchlorides,anhydrides,estersandamides; Comparative study of nucleophilic substitutionatacyl group-Mechanism of acidicandalkaline hydrolysis of esters, Claisencondensation, Reform at sky reactions and Curtius rearrangement

Reactions involving H, OH and COOH groups- salt formation, anhydride formation, acid chloride formation, amide formation and esterification (mechanism). Degradation of carboxylic acids by Huns-Diecker reaction, decarboxylation by Schimdt reaction, Arndt- Eistert synthesis, halogenation by Hell- Volhard- Zelinsky reaction.

UNIT-IV

SPECTROSCOPY **26 h**

Molecular Spectroscopy: **18h**

Interactionofelectromagneticradiationwithmoleculesandvarioustypesof spectra;

Vibrational spectroscopy: Classical equation of vibration, computation of force constant, Harmonic and anharmonic oscillator, Morsepotential curve, vibrational degrees offered for polyatomic molecules, modesofvibration. Selection rules for vibrational transitions, Fundamental frequencies, overtones and hot bands.

Electronic spectroscopy: Energy levels of molecular orbitals (σ, π, n). Selection rules for electronic spectra. Types of electronic transitions in molecules, effect of conjugation. Concept of chromophore. bathochromic and hypsochromic shifts.Beer-Lambert's law and its limitations.

Nuclear Magnetic Resonance (NMR) spectroscopy: Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, NMR splitting of signals - spin-spin coupling, coupling constants. Applications of NMR with suitable examples - ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate, toluene and acetophenone.

UNIT-V **8h**

Application of Spectroscopy to Simple Organic Molecules

Application of visible, ultraviolet and Infrared spectroscopy in organic molecules. Application of electronic spectroscopy and Woodward rules for calculating λmax of conjugated dienes and α,β – unsaturated compounds.

Infrared radiation and types of molecular vibrations, functional group and fingerprint region. IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids.

Reference Books :

1. A Text Book of Organic Chemistry by Bahl and Arunbahl
2. A Text Book of Organic chemistry by I L FinarVol I
3. Organic chemistry by Bruice
4. Organic chemistry by Clayden
5. Spectroscopy by William Kemp
6. Spectroscopy by Pavia
7. Organic Spectroscopy by J. R. Dyer
8. Elementary organic spectroscopy by Y.R. Sharma
9. Spectroscopy by P.S.Kalsi
10. Spectrometric Identification of Organic Compounds by Robert M Silverstein, Francis X Webster
11. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
12. Furniss, B.S., Hannaford, A.J., Smith, P.W.G. &Tatchell, A.R. Practical Organic Chemistry, 5th Ed. Pearson (2012)

LABORATORY COURSE -III

Practical-III Organic preparations and IR Spectral Analysis

(At the end of Semester-III)

30hrs (2 h / w) **50 M**

Course outcomes:

On the completion of the course, the student will be able to do the following**:**

1. how to use glassware, equipment and chemicals and follow experimental procedures in the laboratory
2. how to calculate limiting reagent, theoretical yield, and percent yield
3. how to engage in safe laboratory practices by handling laboratory glassware, equipment, and chemical reagents appropriately
4. how to dispose of chemicals in a safe and responsible manner
5. how to perform common laboratory techniques including reflux, distillation, recrystallization, vacuum filtration.
6. how to create and carry out work up and separation procedures
7. how to critically evaluate data collected to determine the identity, purity, and percent yield of products and to summarize findings in writing in a clear and concise manner

Organic preparations: 40M

1. Acetylation of one of the following compounds:
   Amines (aniline, o-, m-, ptoluidines and o-, m-, p-anisidine) and phenols (β-naphthol, vanillin, salicylic acid) by any one method:
   a) Using conventional method.
   b) Using green approach
2. Benzolyation of one of the following amines
   (aniline, o-, m-, p- toluidines and o-, m-, p-anisidine)
3. Nitration of any one of the following:
   a) Acetanilide/nitrobenzene by conventional method
   b) Salicylic acid by green approach (using ceric ammonium nitrate).

IR Spectral Analysis 10M

IR Spectral Analysis of the following functional groups with examples

a) Hydroxyl groups
b) Carbonyl groups
c) Amino groups
d) Aromatic groups

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Course outcomes:

At the end of the course, the student will be able to;

1. To learn about the lawsof absorption of light energy by molecules and the subsequent photochemical reactions.
2. To understand theconcept of quantum efficiency and mechanisms of photochemical reactions.

UNIT - I
Organometallic Compounds **8h**

Definition and classification of organometallic Compounds on the basis of bond type, Concept of hapticity of organicligands. Metalcarbonyls:18electronrule,electroncountofmononuclear, polynuclear and substituted metalcarbonyls of 3dseries.Generalmethods of preparation of mono and binuclear carbonyls of 3d series.P-acceptor behaviour of carbon monoxide. Synergic effects (VB approach) - (MO diagram of CO can be referred to for synergic effect to IR frequencies).

UNIT – II Carbohydrates **8h**
Occurrence,classificationandtheirbiologicalimportance,Monosaccharides: Constitution and absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ringsize of glucose and fructose, Haworth projections and conformationalstructures; Interconversions of aldosesandketoses; Killiani-Fischer synthesis and Ruffdegradation; Disaccharides– Elementary treatment of maltose, lactose and sucrose. Polysaccharides–Elementary treatment of starch.

UNIT- III
Amino acids and proteins **6h**
Introduction: Definition of Amino acids, classification of Amino acids into alpha, beta, and gamma amino acids. Natural and essential amino acids - definition and examples, classification of alpha amino acids into acidic, basic and neutral amino acids with examples. Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples - Glycine, Alanine, valine and leucine) by following methods: a) from halogenated carboxylic acid b) Gabriel Phthalimide synthesis c) strecker's synthesis.
Physical properties: Zwitter ion structure - salt like character - solubility, melting points, amphoteric character, definition of isoelectric point.
Chemical properties: General reactions due to amino and carboxyl groups - lactams from gamma and delta amino acids by heating- peptide bond (amide linkage). Structure and nomenclature of peptides and proteins.
Heterocyclic Compounds **7h**
Introduction and definition: Simple five membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole - Aromatic character – Preparation from 1, 4, -dicarbonyl compounds, Paul-Knorr synthesis. Properties: Acidic character of pyrrole - electrophillic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions - Diels Alder reaction in furan.
Pyridine – Structure - Basicity - Aromaticity- Comparison with pyrrole- one method of preparation and properties - Reactivity towards Nucleophilic substitution reaction.

UNIT- IV

Nitrogen Containing Functional Groups

Preparation, properties and important treactions of nitrocompounds, amines and diazonium salts.

Nitro hydrocarbons **3h**

Nomenclature and classification-nitro hydrocarbons, structure -Tautomerism of nitroalkanes leading to aci and keto form, Preparation of Nitroalkanes, reactivity -halogenation, reaction with HONO (Nitrous acid), Nef reaction and Mannich reaction leading to Micheal addition and reduction.

Amines: **11h**

Introduction, classification, chiralityin amines (pyramidal inversion), importance and general methods of preparation

Properties : Physical properties, Basicity of amines: Effect of substituent, solvent and steric effects.

Distinction between Primary, secondary and tertiary aminesusing Hinsberg's method and nitrousacid.

Discussion of the following reactions with emphasis on the mechanistic pathway: Gabriel Phthalimide synthesis, Hoffmann- Bromamidereaction, Carbylaminereaction, Mannichreaction, Hoffmann'sexhaustive methylation, Hofmann-elimination reaction and Copeelimination.

Diazonium Salts: Preparation and synthetic applications of diazonium salts including preparation of arenes, haloarenes, phenols, cyano and nitro compounds. Coupling reactions of diazonium salts (preparation of azo dyes).

UNIT- V

Photochemistry **5h**

Difference between thermal and photochemical processes, Laws of photochemistry- Grothus- Draper's law and Stark-Einstein's law of photochemical equivalence, Quantum yield- Photochemical reaction mechanism- hydrogen- chlorine and hydrogen- bromine reaction. Qualitative description of fluorescence, phosphorescence, Jablonski diagram, Photosensitized reactions- energy transfer processes (simple example).

Thermodynamics **12 h**

The first law of thermodynamics-statement, definition of internal energy and enthalpy, Heat capacities and their relationship, Joule-Thomson effect- coefficient, Calculation of work for the expansion of perfect gas under isothermal and adiabatic conditions for reversible processes, State function. Temperature dependence of enthalpy of formation- Kirch off s equation, Second law of thermodynamics Different Statements of the law, Carnot cycle and its efficiency, Carnot theorem, Concept of entropy, entropy as a state function, entropy changes in reversible and irreversible processes. Entropy changes in spontaneous and equilibrium processes. Third law of thermodynamics, Nernst heat theorem, Spontaneous and non- spontaneous processes, Helmholtz and Gibbs energies-Criteria for spontaneity

Reference Books :

1. Concise coordination chemistry by Gopalan and Ramalingam

2. Coordination Chemistry by Basalo and Johnson

3. Organic Chemistry by G.Mareloudan, Purdue Univ

4. Text book of physical chemistry by S Glasstone

6. Concise Inorganic Chemistry by J.D.Lee

7. Advanced Inorganic Chemistry Vol-I by Satyaprakash, Tuli, Basu and Madan

8. A Text Book of Organic Chemistry by Bahl and Arunbahl

9. A Text Book of Organic chemistry by I L FinarVol I

10. A Text Book of Organic chemistry by I L FinarVol II

LABORATORY COURSE -IV

Practical-IV Organic Qualitative analysis

(At the end of Semester-IV)

30hrs (2 h / w) **50 M**

Course outcomes:

At the end of the course, the student will be able to;

1. Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
2. Determine melting and boiling points of organic compounds
3. Understand the application of concepts of different organic reactions studied in theory part of organic chemistry

Organic Qualitative analysis **50 M**

Analysis of an organic compound through systematic qualitative procedure for functional group identification including the determination of melting point and boiling point with suitable derivatives. Alcohols, Phenols, Aldehydes, Ketones, Carboxylic acids, Aromatic primary amines, amides and simple sugars

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Course outcomes:

At the end of the course, the student will be able to;

1. Understand concepts Of boundary conditions and quantization, probability distribution, most probable values, uncertainty and expectation values
2. Application of quantization to spectroscopy.
3. Various types of spectra and the irusein structure determination.

INORGANIC CHEMISTRY

UNIT –I **26 h**

Coordination Chemistry **12h**

IUPAC nomenclature of coordination compounds, Structural and stereoisomerism in complexes with coordination numbers 4 and 6. Valence Bond Theory (VBT): Inner and outer orbital complexes. Limitations of VBT, Crystal field effect, octahedral symmetry. Crystal field stabilization energy (CFSE), Crystal field effects for weak and strong fields. Tetrahedral symmetry, Factors affecting the magnitude of crystal field splitting energy, Spectrochemical series, Comparison of CFSE for Octahedral and Tetrahedral complexes, Tetragonal distortion of octahedral geometry, Jahn-Teller distortion, square planar coordination

UNIT –II

InorganicReactionMechanism: **4h**

Introduction to inorganic reaction mechanisms. Concept of reaction pathways, transitionstate, intermediate and activated complex. Labile and inert complexes, lig and substitution reactions - SN1 and SN2,Substitutionreactions in square planar complexes, Trans-effect, the ories of trans effect and its applications

Stability of metal complexes: **2h**

Thermodynamic stability and kinetic stability, factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and mole ratio method

Bioinorganic Chemistry: **8h**

Metalions present inbiological systems, classification of elements according to their action in biolog ical system. Geochemical effect on the distribution of metals, Sodium/K- pump, carbonicanhydrase and carboxypeptidase.

Excess and deficiency of sometracemetals Toxicityofmetalions(Hg,Pb,CdandAs), reasons fortoxicity, Use of chelatingagentsinmedicine, Cisplatinasananti-cancerdrug. Iron and its application in bio-systems Haemoglobin, Myoglobin. Storage and transfer of iron

PHYSICAL CHEMISTRY **34 h**

UNIT-III

1 .Phase rule **6h**

Concept of phase, components, degrees of freedom Thermodynamic derivation of Gibbs phase rule. Phase diagram of one component system - water system, Study of Phase diagrams of Simple eutectic systems i) Pb-Ag system, desilverisation of lead ii) NaCl-Water system, Congruent and incongruent melting point- Definition and examples for systems having congruent and incongruent melting point , freezing mixtures.

UNIT-IV

Electrochemistry **14h**

Specific conductance, equivalent conductance and molar conductance- Definition and effect of dilution Cell constant Strong and weak electrolytes, Kohlrausch's law and its applications, Definition of transport number, determination of transport number by Hittorf's method. Debye-Huckel-Onsagar's equation for strong electrolytes (elementary treatment only), Application of conductivity measurements- conductometric titrations Electrochemical Cells- Single electrode potential, Types of electrodes with examples: Metal- metal ion, Gas electrode, Inert electrode, Redox electrode, Metal-metal insoluble salt- salt anion. Determination of EMF of a cell, Nernst equation, Applications of EMF measurements
- Potentiometric titrations.
Fuel cells- Basic concepts, examples and applications

UNIT-V

Chemical Kinetics: **14 h**

The concept of reaction rates Effect of temperature, pressure, catalyst and other factors on reaction rates Order and molecularity of a reaction, Derivation of integrated rate equations for zero, first and second order reactions (both for equal and unequal concentrations of reactants). Half–life of a reaction. General methods for determination of order of a reaction. Concept of activation energy and its calculation from Arrhenius equation. Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only).Enzyme catalysis- Specificity,

factors affecting enzyme catalysis, Inhibitors and Lock & key model. Michaels- Menten equation-derivation, significance of Michaelis-Menten constant.

Reference Books :

1. Text book of physical chemistry by S Glasstone
2. Concise Inorganic Chemistry by J.D.Lee
3. Advanced Inorganic Chemistry Vol-I by Satyaprakash, Tuli, Basu and Madan
4. Advanced physical chemistry by Gurudeep Raj
5. Principles of physical chemistry by Prutton and Marron
6. Advanced physical chemistry by Bahl and Tuli
7. Inorganic Chemistry by J.E.Huheey
8. Basic Inorganic Chemistry by Cotton and Wilkinson
9. A textbook of qualitative inorganic analysis by A.I. Vogel
10. Atkins,P.W.&Paula,J.deAtkin'sPhysicalChemistryEd.,Oxford UniversityPress 10thEd(2014).
11. Castellan,G.W.PhysicalChemistry4thEd.Narosa(2004).
12. Mortimer,R. G.PhysicalChemistry3rdEd. Elsevier:NOIDA,UP(2009).
13. Barrow,G.M.PhysicalChemistry

LABORATORY COURSE -V

Practical-V : Conductometric and Potentiometric Titrimetry

(At the end of Semester-IV)

30hrs (2 h / w) **50 M**

Course outcomes:

At the end of the course, the student will be able to;

1. Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
2. Apply concepts of electrochemistry in experiments
3. Be familiar with electro analytical methods and techniques in analytical chemistry which study an analyte by measuring the potential (volts) and/or current (amperes) in an electrochemical cell containing the analyte

Conductometric and Potentiometric Titrimetry **50 M**

1. **Conductometric titration**- Determination of concentration of HCl solution using standard NaOH solution.
2. **Conductometric titration**- Determination of concentration of CH3COOH Solution using standard NaOH solution.
3. **Conductometric titration**- Determination of concentration of CH3COOH and HCl in a mixture using standard NaOH solution.
4. **Potentiometric titration**- Determination of Fe (II) using standard K2Cr2O7 solution.
5. Determination of rate constant for acid catalyzed ester hydrolysis.

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SKILL DEVELOPMENT COURSE (SDC)

Offered by Department of Chemistry for Non Chemistry Students

I-SEMESTER

PAER-I : ENVIRONMENTAL CHEMISTRY

Marks: External Evaluation: 30 M **Internal Evaluation : 20 M**

UNIT-I

Chemical composition of Atmosphere – particles, ions and radicals .Oxides of N,C,S and their effects. Pollution by chloro fluorocarbons, Green house effect,
Acid rain.

UNIT –II

Compositions of lithosphere-soil, Chemical properties of soil. Inorganic and Organic components in soil. Acid – base and ion exchange reactions in soil. Micro and Macro nutrients, Nitrogen pathways and NPK in soil.

UNIT –III

Hydrological cycle, Aquatic pollutions (inorganic ,organic pesticides, agricultural, industrial , sewage and detergents and sewage) water quality parameters.-DO,COD,BOD. Purification and treatment of sewage water.

COURSE OUTCOME:

The students will be trained to understand and discuss the main principles, theories and concepts underlying established knowledge in chemistry.

Co-curricular activities:

Group discussions, Debates, seminars, Slip test, Assignments.

SKILL DEVELOPMENT COURSE (SDC)

Offered by Department of Chmistry for Non Chemistry Students

II-SEMESTER

PAER-II : FOOD CHEMISTRY

Marks: External Evaluation: 30 M **Internal Evaluation : 20 M**

UNIT-I: Source, compositions and nutritive value of Foods:
Plant foods: cereals, Pulses, Fruits and vegetables.
Animal Foods: milk, meat, fish and egg.
Health foods :Functional foods, prebiotics, probiotics, Neutraceuticals .

UNIT-II : Carbohydate,Lipids and Proteins:

Classification ,functions and properties of Cardohydrate:
a)Mono saccharides: Glucose, fructose.
b)Oligo saccharides :Maltose, lactose .
c)Poly saccharides: starch, cellulose
Classification ,functions and properties of lipids: saturated and unsaturated
Classification, functions and properties of proteins.

UNIT-III: Vitamin and minerals:

Sources , function, requirement and deficiency of fat soluble vitaims
Sources , function, requirement and deficiency of water soluble vitaims.
Sources, function, requirement and deficiency of macro and micro nutrients

COURSE OUTCOME:

The students will be trained to understand and discuss the main principles, theories and concepts underlying established knowledge in food chemistry. On completing this course, students should be able to:
1) understand the source, importance and nutritive values of plant, animal and functional foods.
2)Describe reactions and mechanisms in food chemistry.
3)Explain the chemistry of the most important food components ,including their properties and reactions.
4)Develop and distinguish how individual food components contributes to the quality of foods

CO-CURRICULAR ACTIVITES:

Group discussions, Debates, Seminars, Sliptest , Assaignments

SKILL DEVELOPMENT COURSE (SDC)

Offered by Department of Chmistry for Non Chemistry Students

III-SEMESTER

PAER-III : POLYMER CHEMISTRY

Marks: External Evaluation: 30 M **Internal Evaluation : 20 M**

Unit-I

Introduction of polymers: Basic definitions, degree of polymerization, classification of polymers- Natural and synthetic polymers ,organic and inorganic polymers, Thermoplastic and Thermosetting polymers,plastics, Elastomers , fibers and Resins,

Unit-II

Classification based on structure of polymers: Linear , Branched and cross Linked polymers, chemistry of polymerization: chain polymerization, step polymerization and co-ordination polymerization.

Unit-III

Polymers additives: introduction to plastic additives-plasticizers and softeners, Lubricants and flow promoters, Anti aging additives, colourants, blowing agents,

Polymer and their applications: industrial applications of polyethylene, polyvinyl chloride , Teflon, Nylon 6,6.

SKILL DEVELOPMENT COURSE (SDC)

Offered by Department of Chmistry for Non Chemistry Students

III-SEMESTER

PAER-IV : PHARMACEUTICAL AND INDUSTRIAL CHEMISTRY

Marks: External Evaluation: 30 M **Internal Evaluation : 20 M**

Unit-I

Pharmaceutical chemistry –terminology: pharmacy, pharmacology, pharmocophore, pharmacodynamics, pharmacokinetics (ADME) ,
Principles of drug discovery, clinical trials, drug metabolism.

Unit-II

Therapeuticactivity of the following drugs. L-Dopa, chloroquin,

Omeprazole, albuterol ,ciprofioxicin , paracetamol and aspirin.

Unit-III

Introduction of pesticides- types- insecticides, fungicides, herbicides ,

Rodenticides –one example. Uses –plant gowth regulaters, pheromones

And hormones

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