# UNIVERSITY OF MYSORE

## Department of Studies in Chemistry, Manasagangotri, Mysore - 06

### Modalities for the Assessment of Marks for Ph.D. Course Work

### (a) Paper – I: Research Methodology and Applied Chemistry

In Paper – I, there will be three units of 16 hours each. The units are as follows:

**Unit – I:** Research Methodology

**Unit – II:** Spectroscopy and Thermal Methods of Analysis

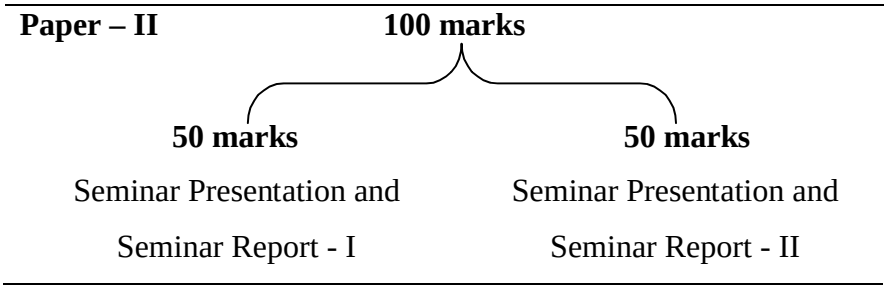
**Unit – III:** Advanced Chemistry, giving equal weightage for all the four branches of Chemistry *viz.*, Analytical/Inorganic/Organic/Physical.

The units will be taught by the faculty members of the department. A student has to study all the three units during the course and appear for the written assessment test for 50 marks conducted by the Directorate of Research. The remaining 50 marks is distributed as follows: A student has to present one seminar and submit one assignment during the course work as far as the Paper I is concerned. Seminar will be assessed for 30 marks which will be of 30 minutes duration. Assignment will be assessed for 20 marks. Assessment of seminars and assignment will be done by those faculty members who will handle the classes for the course work. Assignment will be given by all the teachers who are engaged in teaching the course work. Further, at the end of the course work average marks will be taken for seminar and assignment/s separately.

| **Paper – I** | **100 marks** | |
|---|---|---|
| | **50 marks** | **50 marks** |
| | Three units as above for the written assessment test | Seminar: 30 marks<br>Assignment: 20 marks |

## (b) <u>Paper – II:</u> Review of Literature in the Area of Research

In Paper – II, a student has to present two seminars (I and II), one during 8th week and another during 15th week of the course. In seminar I, a student has to highlight his/her broad area of the research work and in seminar II the review of literature, objectives etc should be given. It is stated in the letter No: UOM/DOR/5/Ph.D/2011-12 dated 26/08/2011 [(d) on page 2] that Department Council shall assess the students for Paper – II in the area of research paper. **Since the members in the Department Council of the DOS in Chemistry is very large (17 members), it was resolved that Doctoral Committee members (Guide, Chairman of the department and two senior faculty members) shall assess the same.**



# Syllabus for Ph.D. Course Work

## Paper – I : Research Methodology and Applied Chemistry

## UNIT – I

## RESEARCH METHODOLOGY

Nature, need, scope of research; Types of research: fundamental and applied

**Tools and Techniques of Research:** Use of library, research books, monograph, periodicals, abstracts, documents, use of internet in chemical literature search.

**Reporting of Research:** Form and style, format, questions, footnotes, bibiliographical references, tables, figures, elucidations, typing of thesis, writing research papers/dissertation, submission, hardcopy, online submission, e-submission etc.

## UNIT – II

## SPECTROSCOPY AND THERMAL METHODS OF ANALYSIS

Principles and applications of UV-Vis, IR, NMR ($^{1}H$, $^{13}C$, $^{19}F$, $^{31}P$ and $^{11}B$), mass, ESR and NQR spectroscopy for the structural elucidation of compounds.

**Two Dimensional NMR Spectroscopy:** COSY, NOSEY, INDOR and SPI, DEPT spectra, CIDNP techniques and MRI.

**Thermal Methods of Analysis:** Principle and applications of TGA, DTA and DSC; Cyclic voltammetry.

## UNIT – III

## ADVANCED CHEMISTRY

**Statistical Treatment of Analytical Data:** Student's t-test, Confidence interval of the mean, Testing for significance – comparison of the means and two standard deviations.

**Standardization and Calibration:** Comparison with standards – direct comparison and titrations, External standard calibration – the least square method. Figures of merit of analytical methods – sensitivity and detection limit, linear dynamic range.

**Concepts of Acids and Bases:** Bronsted-Lowry, Lux-Flood, Lewis, Hard and soft acids and bases (HSAB).

**Solvent Systems:** Liquid ammonia, acetic acid and sulphuric acid

Periodic properties, catalytic applications, organometallic compounds, metal-metal bonding, spectral and magnetic properties of d- and f-block elements, NMR shift reagents.

**Separation techniques**

**Purification:** Crystallization, sublimation, fractional crystallization, distillation techniques (simple distillation, steam distillation, distillation under reduced pressure, fractional distillation) Solvent extraction

**Chromatography:** Thin layer chromatography, Column chromatography, Paper chromatography, Gas liquid chromatography, Ion exchange chromatography, High pressure liquid chromatography (HPLC)

**Gel Permeation Chromatography**: Size exclusion chromatography (Gel filtration) with special reference to separation of proteins, carbohydrates and nucleic acids.

**Solid State Chemistry**: Crystal and molecular structure studies of organic and inorganic compounds by x-ray crystallography (single crystals), crystal growth, programmes used to solve structure, structure refinement, CIF, CIF-tab, R-value, WinGX, Platon, Ortep, enCifer, Mercury, CCDC, CSD, Bond-lengths and bond angles, torsion angle, Hydrogen bonding interactions, Packing, Disorder, Polymorphism & pseudopolymorphism.

**Electrochemistry:** Electrochemical oxidation and degradation of organic compounds, synthesis of nano materials by hydrothermal, electrochemical and solgel methods, Applications: Photodegradation, catalytic reactions and electrical, Effect of inhibitors on the rate of corrosion.

## References:


1. Organic Spectroscopy, William Kemp, English Language Book society, Macmillan, 1987.
2. Application of Absorption Spectroscopy of Organic Compounds, John R. Dyer, Prentice Hall of India Private Ltd., New Delhi, 1974.
3. Spectrometric Identification of Organic Compounds, 4th edition, Robert M. Silverstein, G. Clayton Bassler and Terence C. Morrill, John Wiley & Sons, New York, 1981.
4. An Introduction to Practical Organic Chemistry – Robert, Vingrove etc.
5. Fundamentals of Analytical Chemistry, Skoog, West, Hollar and Crouch, 8th Ed.
6. Modern Analytical Chemistry by David Harvey, 3rd Ed.
7. K. Albert, L. Lehninger, D.L. Nelson, M.M. Cox, Principles of Biochemistry, CBZ publishers, 1st edition, New Delhi, 1993.

8. Encyclopedia of Chemical Technology – Kirck-Othmer series.
9. Inorganic Chemistry (4th edition): J.E. Huheey, E.A. Keiter and R.L. Keiter.
10. Advanced Inorganic Chemistry (5th edition): F.A. Cotton and G. Wilkinson: Wiley
11. An Introduction to X-ray Crystallography, Michael M. Woolfson
12. Crystal Structure Determination, Werner Massa & Robert O. Gould
13. Introduction to Electrochemistry by S. Glasstone.

# Time-Table for the Course Work of Ph.D. Programme

| Date/Day (Saturday) | 10.00 am to 11.00 am | 11.00 am to 12.00 noon | 12.00 noon to 01.00 pm |
|---|---|---|---|
| 28/01/2012 | **Unit-I** SAA | **Unit-II** DCG | **Unit-III** KB |
| 04/02/2012 | **Unit-II** KMLR | **Unit-III** KB | **Unit-I Library** |
| 11/02/2012 | **Unit-III** KB | **Unit-I Library** | **Unit-II** KMLR |
| 18/02/2012 | **Unit-I** SAA | **Unit-II** PN | **Unit-III** KB |
| 25/02/2012 | **Unit-II** PN | **Unit-III** KMLR | **Unit-I Library** |
| 03/03/2012 | **Unit-III** KMLR | **Unit-I Library** | **Unit-II** PN |
| 10/03/2012 | **Unit-I** SAA | **Unit-II** PN | **Unit-III** SS |
| 17/03/2012 | **Unit-II** DCG | **Unit-III** SS | **Unit-I PS** |
| 24/03/2012 | **Unit-III** HSY | **Unit-I PS** | **Unit-II** DCG |
| 07/04/2012 | **Unit-I** SAA | **Unit-II** DCG | **Unit-III** HSY |
| 21/04/2012 | **Unit-II** DCG | **Unit-III** SA | **Unit-I PS** |
| 28/04/2012 | **Unit-III** KNM | **Unit-I BBK** | **Unit-II** DCG |
| 05/05/2012 | **Unit-I** SAA | **Unit-II** DCG | **Unit-III** GN |
| 12/05/2012 | **Unit-II** GN | **Unit-III** NN | **Unit-I BBK** |
| 19/05/2012 | **Unit-III** HDR | **Unit-I BBK** | **Unit-II** GN |

**Note:**

(i) Lecture classes will be held in the Auditorium.

(ii) The candidates are divided into two groups. Those enrolled/registered as per 2004 regulations are in Group I and those who are going to get provisional registration as per 2010 regulations are in Group II.

Teachers comprising Group I and II are as follows:

**Group I:** SAA, GN, KMLR, SA, PN, SS, MPS, BSP

**Group II:** DCG, HSY, YBB, KB, NN, HDR, KNM, KM

(iii) Seminar classes will be held from 02.00 pm to 05.00 pm on the dates mentioned above. Seminars will be held in Auditorium for Group I and Lecture Hall – 2 for Group II.

(iii) Power point presentation is desirable for delivering the seminar.

(iv) Research Scholars are hereby informed to get corrected the seminar topics well in advance by the concerned teacher and submit the final corrected copy to The Chairman of the department.

# UNIVERSITY OF MYSORE

## Department of Studies in Chemistry, Manasagangotri, Mysore – 570 006

## List of Seminar Topics and Assignments for the Course Work of Ph.D. Programme

## Group I (as per 2004 Ph.D. Regulations)

| Sl. No. | Name of the Candidates | Seminar Topic and Date | | Assignment* |
|---|---|---|---|---|
| 1 | Amos Victor | Purification by crystallization, sublimation and fractional crystallization | 11/02/2012 | UV-Vis Spectroscopy – Principles and applications |
| 2 | ASHA M. S. | Bronsted-Lowry concepts of acids and bases, their advantages and limitations | 11/02/2012 | Evaluation of the reliability of experimental results – Student's t-test and confidence interval of the mean |
| 3 | Bommegowda Y. K. | Purification by distillation techniques (simple, steam, fractional and distillation under reduced pressure | 11/02/2012 | Basics of X-ray crystallography and crystal growth |
| 4 | BUSHRA BEGUM A | Lux-Flood and Lewis concepts of acids and bases | 11/02/2012 | Testing for significance – Comparison of two means and two standard deviations |
| 5 | Chakravarthy M. P. | Theories of corrosion and effect of pH on rate of corrosion | 11/02/2012 | Spectral and magnetic properties of f-block elements |
| 6 | DEEPAKUMARI H. N. | HSAB concept of acids and bases | 18/02/2012 | Principles, methodology and applications of TGA |
| 7 | Shridevi D. D. | Solvent extraction | 18/02/2012 | IR Spectroscopy – Principles and applications |
| 8 | Gurudatt D. M. | Corrosion control by inhibitors | 18/02/2012 | Spectral and magnetic properties of d-block |

| | | | | |
|---|---|---|---|---|
| | | | | elements |
| 9 | HARINI S. T. | Thin layer chromatography | 18/02/2012 | A survey of the organo metallic compounds of d- and f-block elements |
| 10 | Honnur Krishna | Instrumentation and factors affecting shapes of TG curves | 18/02/2012 | Nature, need and scope of research |
| 11 | JENIFER T. A. | Column chromatography | 25/02/2012 | Electrochemical degradation of organic compounds |
| 12 | Kiran Shankar | Spectral and magnetic properties of f-block elements | 25/02/2012 | Fundamental and applied research |
| 13 | Krishna M. H. | Paper chromatography | 25/02/2012 | Calibration by standard-addition methods – single point and multi point addition procedures |
| 14 | Lakshmi Ranganath V | Gas liquid chromatography | 25/02/2012 | Photodegradation of organic compounds with nanometal oxides |
| 15 | Lingaraju G. S. | Anisotropic effect (including in annulenes) | 25/02/2012 | Calibration with external standards – use of single and multi-point standards |
| 16 | MADHUSHREE N. N. | Synthesis of nano materials by hydrothermal method and its applications in catalytic reactions | 03/03/2012 | Catalytic applications of d- and f-block elements and their compounds |
| 17 | Mallesha N | Spin-spin decoupling | 03/03/2012 | Periodic properties of d- and f-block elements |
| 18 | Mallikarjunaswamy C | Cyclic voltammetry – Principles, instrumentation and applications | 03/03/2012 | Reactions in acetic and sulphuric acids as solvent systems |
| 19 | MANASA C. S. | Simplification of non-first order spectra into first order spectra (Double resonance technique and increasing field strength) | 03/03/2012 | Use of library in research work |

| | | | | |
|---|---|---|---|---|
| 20 | Mohan C. S. | Calibration with standards – Direct comparison, titrations and use of internal standards | 03/03/2012 | Corrosion control by inhibitors |
| 21 | Naik Ravikumar Nagaraj | Liquid ammonia as a reaction medium and types of reactions in liq. ammonia | 10/03/2012 | Instrumentation and factors affecting shapes of TG curves |
| 22 | Nandeesh K. N. | Ion exchange chromatography | 10/03/2012 | Theories of corrosion and effect of pH on rate of corrosion |
| 23 | PADMAVATHI K. N. | ESR Spectroscopy – Principles and applications | 10/03/2012 | Principles, methodology and applications of DTA |
| 24 | SHILPA P. C. | Reactions in acetic and sulphuric acids as solvent systems | 10/03/2012 | Synthesis of nano materials by sol-gel method and its application in optical glasses |
| 25 | Paulas A. R. | Calibration with external standards – Use of simple and multi-point standards | 10/03/2012 | Liquid ammonia as a reaction medium and types of reactions in liq. ammonia |
| 26 | PAVITHRA G | Periodic properties of d- and f-block elements | 17/03/2012 | Comparison of DTA with DSC wrt principles, instrumentation and applications |
| 27 | Pradeep Kumar C. B. | Electrochemical degradation of organic compounds | 17/03/2012 | HSAB concept of acids and bases |
| 28 | Prashanth K. N. | Calibration – Use of external standards and the method of least squares | 17/03/2012 | Purification by crystallization, sublimation and fractional crystallization |
| 29 | Prashanth M. K. | Catalytic applications of d- and f-block elements and their compounds | 17/03/2012 | Cyclic voltammetry – Principles, instrumentation and applications |
| 30 | Raghavendra G. M. | High performance liquid chromatography | 17/03/2012 | Programs used in x-ray crystallography |
| 31 | Raghavendra K. R. | Size-exclusion chromatography | 24/03/2012 | Polymorphism and pseudoolymorphism |
| 32 | Raghu K | Simplification of non-first order spectra into first order spectra (Isotopic substitution and lanthanide shift reagents) | 24/03/2012 | Photodegradation of organic compounds with nanometal oxides |

| | | | | |
|---|---|---|---|---|
| 33 | Raghu M. S. | Calibration by standard-addition methods – Single point and multi point addition procedures | 24/03/2012 | Purification by distillation techniques (simple, steam, fractional and distillation under reduced pressure) |
| 34 | Raju D | Principles and applications of COSY and NOESY with suitable examples | 24/03/2012 | Synthesis of nano materials by hydrothermal method and its applications in catalytic reactions |
| 35 | Rakesh | Synthesis of nano materials by hydrothermal method and its applications in catalytic reactions | 24/03/2012 | Calibration with standards – Direct comparison, titrations and use of internal standards |
| 36 | Rangaswamy J | A brief note on INDOR and SPI | 07/04/2012 | Lux-Flood and Lewis concepts of acids and bases |
| 37 | RENUKA N | Catalytic applications of d- and f-block elements and their compounds | 07/04/2012 | Writing research papers/dissertation |
| 38 | Revanna C. N. | An account of DEPT in spectroscopy with relevant examples | 07/04/2012 | Bronsted-Lowry concepts of acids and bases, their advantages and limitations |
| 39 | ROOPASHREE R | Application of CIDNP technique in the structural elucidation of compounds | 07/04/2012 | Synthesis of nano-materials by sol-gel method and its application in optical glasses |
| 40 | Shantharam C. S. | $^{13}C$ NMR and its application in predicting the structure of organic compounds | 07/04/2012 | Thin layer chromatography |
| 41 | Sharath V | Application of $^{19}F$ NMR in the structural elucidation of inorganic complexes | 21/04/2012 | Calibration with external standards – Use of single and multi-point standards |
| 42 | Shivakumar S. B. | Synthesis of nano-materials by sol-gel method and its application in optical glasses | 21/04/2012 | IR spectroscopy – Principles and application |
| 43 | Shivakumar S. S | A survey of the organometallic compounds of d- and f-block elements | 21/04/2012 | Submission of papers (hard copy, online and e-submission) |

| | | | | |
|---|---|---|---|---|
| 44 | Shubakara K | Basics and applications of $^{31}P$ NMR in inorganic metal complexes | 21/04/2012 | Chemical shift and factors affecting it (electronegativity, hydrogen bonding and van-der Walls force) |
| 45 | SOWBHAGYA | Synthesis of nano-composites of metal sulphides by electrochemical method and its applications in the degradation of industrial waste water | 21/04/2012 | ESR spectroscopy – Principles and application |
| 46 | Srikanthmurthy N | NQR spectroscopy – Principles and application | 28/04/2012 | Spin-spin decoupling |
| 47 | SULOCHANA P. M. | Spectral and magnetic properties of d-block elements | 28/04/2012 | Use of internet in chemical literature search |
| 48 | Suyoga Vardhan D. M. | Methods of ionization in mass spectroscopy | 28/04/2012 | Column chromatography |
| 49 | Swaroop T. R. | Rearrangement reactions in mass spectrometry | 28/04/2012 | Theories of corrosion and effect of pH on rate of corrosion |
| 50 | Ullas B. J. | Basics of x-ray crystallography and crystal growth | 28/04/2012 | Anisotropic effect (including in annulenes) |
| 51 | Umesha B | Polymorphism and pseudopolymorphism | 05/05/2012 | $^{13}C$ NMR and its application in predicting the structure of organic compounds |
| 52 | Vasanthkumar G | Spectral and magnetic properties of f-block elements | 05/05/2012 | Methods of ionization in mass spectroscopy |
| 53 | VATHSALA DEEPU C | Programs used in x-ray crystallography | 05/05/2012 | Simplification of non-first order spectra into first order spectra |
| 54 | Vinayaka A. C. | General methods of fragmentation in MS | 05/05/2012 | Application of CIDNP technique in the structural elucidation of compounds |

**Note:** Seminars will be held in the Auditorium;

*: Last date to submit the assignment is ***on or before 31st March 2012***

# UNIVERSITY OF MYSORE

## Department of Studies in Chemistry, Manasagangotri, Mysore – 570 006

## List of Seminar Topics and Assignments for the Course Work of Ph.D. Programme

## Group II (as per 2010 Ph.D. Regulations)

| Sl. No. | Name of the Candidates | Seminar Topic and Date | | Assignment* |
|---|---|---|---|---|
| 1 | AKSHATHA A | Purification by crystallization, sublimation and fractional crystallization | 11/02/2012 | Evaluation of the reliability of experimental results – Student's t-test and confidence interval of the mean |
| 2 | ANAMIKA SHARMA | Purification by distillation techniques (Simple, steam, fractional and distillation under reduced pressure) | 11/02/2012 | Bronsted-Lowry concepts of acids and bases, their advantages and limitations |
| 3 | Anil Kumar C. N. | Evaluation of the reliability of experimental results – Student's t-test and confidence interval of the mean | 11/02/2012 | Purification by crystallization, sublimation and fractional crystallization |
| 4 | Ashok B | Bronsted-Lowry concepts of acids and bases, their advantages and limitations | 11/02/2012 | Testing for significance – Comparison of two means and two standard deviations |
| 5 | ASHWINI N | Solvent extraction | 11/02/2012 | General methods of fragmentation in MS |
| 6 | Basavaraju B. C. | Electrochemical degradation of organic compounds | 18/02/2012 | Lux-Flood and Lewis concepts of acids and bases |
| 7 | Byre Gowda G | Testing for significance – Comparison of two means and two standard deviations | 18/02/2012 | Solvent extraction |
| 8 | CHAITRA T. K. | Theories of corrosion and effect of pH on rate of | 18/02/2012 | Nature, need and scope of research |

| | | | | |
|---|---|---|---|---|
| | | corrosion | | |
| 9 | CHAITRA MALLU M | Thin layer chromatography | 18/02/2012 | Electrochemical degradation of organic compounds |
| 10 | Chandan T. V. | Column chromatography | 18/02/2012 | Basics of x-ray crystallography and crystal growth |
| 11 | CHAYA G | Principles, methodology and applications of TGA | 25/02/2012 | Thin layer chromatography |
| 12 | Dakshayini C | HSAB concept of acids and bases | 25/02/2012 | Fundamental and applied research |
| 13 | Dhondiba Vishwanath | Paper chromatography | 25/02/2012 | Polymorphism and pseudopolymorphism |
| 14 | Dinesha H. E. | Gas liquid chromatography | 25/02/2012 | HSAB concept of acids and bases |
| 15 | Girish Y. R. | Ion exchange chromatography | 25/02/2012 | Instrumentation and factors affecting shapes TG curves |
| 16 | KAVITHA C. N. | Basics of x-ray crystallography and crystal growth | 03/03/2012 | Column chromatography |
| 17 | Kumar Naik K. H. | Liquid ammonia as a reaction medium and types of reactions in liq. ammonia | 03/03/2012 | Photodegradation of organic compounds with nano metal oxides |
| 18 | Madhukar B. S. | Photodegradation of organic compounds with nano metal oxides | 03/03/2012 | Paper chromatography |
| 19 | Mahendra K. R. | HPLC | 03/03/2012 | Liquid ammonia as a reaction medium and types of reactions in liq. ammonia |
| 20 | MANPREET KAUR | Programs used in x-ray crystallography | 03/03/2012 | Principles, methodology and applications of DTA |
| 21 | MARY ANNE ANITHA | Size exclusion chromatography | 10/03/2012 | Synthesis of nano-materials by hydrothermal method and its applications in catalytic reactions |

| | | | | |
|---|---|---|---|---|
| 22 | Obaiah O | UV-Vis spectroscopy – Principles and application | 10/03/2012 | Gas liquid chromatography |
| 23 | Pavan Kumar C. S. | IR spectroscopy – Principles and application | 10/03/2012 | Use of library in research work |
| 24 | Pradeepa Kumara C. S. | Instrumentation and factors affecting shapes TG curves | 10/03/2012 | Ion exchange chromatography |
| 25 | Prashanth T | Chemical shift and factors affecting it (electronegativity, hydrogen bonding and van-der Walls force) | 10/03/2012 | Synthesis of nano-composites of metal sulphides by electrochemical method and its applications in the degradation of industrial waste water |
| 26 | PREMA | Synthesis of nano-materials by hydrothermal method and its applications in catalytic reactions | 17/03/2012 | Reactions in acetic and sulphuric acids as solvent systems |
| 27 | Raghu | Reactions in acetic and sulphuric acids as solvent systems | 17/03/2012 | HPLC |
| 28 | Raghu N | Spin-spin decoupling | 17/03/2012 | Methods of ionization in mass spectroscopy |
| 29 | Rakesh K. P. | Anisotropic effect (including in annulenes) | 17/03/2012 | Periodic properties of d- and f-block elements |
| 30 | RAKSHA K. R. | Synthesis of nano-composites of metal sulphides by electrochemical method and its applications in the degradation of industrial waste water | 17/03/2012 | Size exclusion chromatography |
| 31 | Ramesha | Simplification of non-first order spectra into first order spectra | 24/03/2012 | Comparison of DTA with DSC with respect to principles, instrumentation and applications |
| 32 | Ramesha A. B. | Principles and applications of COSY and NOESY with suitable examples | 24/03/2012 | Synthesis of nano-materials by sol-gel method and its application in optical glasses |
| 33 | Ranjith S | Periodic properties of d- and f-block elements | 24/03/2012 | Catalytic applications of d- and f-block |

| | | | | |
|---|---|---|---|---|
| | | | | elements and their compounds |
| 34 | Raveendra D. P. | A brief note on INDOR and SPI | 24/03/2012 | Cyclic voltammetry – Principles, instrumentation and applications |
| 35 | RAZIA SULTHANA | Principles, methodology and applications of DTA | 24/03/2012 | UV-Vis spectroscopy – Principles and application |
| 36 | RENUKAMBA C. S. | An account of DEPT in spectroscopy with relevant examples | 07/04/2012 | Use of internet in chemical literature search |
| 37 | ROOPA R. A. | Calibration with standards – Direct comparison, titrations and use of internal standards | 07/04/2012 | IR spectroscopy – Principles and application |
| 38 | Sajan P. G. | Corrosion control by inhibitors | 07/04/2012 | Calibration with standards – Direct comparison, titrations and use of internal standards |
| 39 | SANDHYA N. C. | Synthesis of nano-materials by sol-gel method and its application in optical glasses | 07/04/2012 | ESR spectroscopy – Principles and application |
| 40 | Santhosh S Poojary | Applications of $^{31}P$ and $^{15}N$ NMR in the structural elucidation | 07/04/2012 | A survey of the organometallic compounds of d- and f-block elements |
| 41 | SAVITHA H. S. | Comparison of DTA with DSC with respect to principles, instrumentation and applications | 21/04/2012 | Theories of corrosion and effect of pH on the rate of corrosion |
| 42 | Sharath Kumar K. S. | Application of CIDNP technique in the structural elucidation of compounds | 21/04/2012 | Writing research papers/dissertation |
| 43 | Shivakumara K. N. | Cyclic voltammetry – Principles, instrumentation and applications | 21/04/2012 | NQR spectroscopy – Principles and application |
| 44 | Shivaprakash S | Catalytic applications of d- and f-block elements and their compounds | 21/04/2012 | Calibration with external standards – Use of single and multi-point standards |
| 45 | SHUBHAVATHI T | Application of $^{19}F$ NMR in the structural | 21/04/2012 | Theories of corrosion and effect of pH on |

| | | | | |
|---|---|---|---|---|
| | | elucidation of inorganic complexes | | the rate of corrosion |
| 46 | Siddaramaiah C. R. | $^{13}C$ NMR and its application in predicting the structure of organic compounds | 28/04/2012 | Spectral and magnetic properties of d-block elements |
| 47 | SOWMYA P. T. | Methods of ionization in mass spectroscopy | 28/04/2012 | Submission of papers (hard copy, online and e-submission) |
| 48 | Sridhar B. T. | A survey of the organometallic compounds of d- and f-block elements | 28/04/2012 | Calibration – Use of external standards and the method of least squares |
| 49 | SUSHMA SAMPATH D | Spectral and magnetic properties of d-block elements | 28/04/2012 | Chemical shift and factors affecting it (electronegativity, hydrogen bonding and van-der Walls force) |
| 50 | Swamy N | Calibration with standards – Direct comparison, titrations and use of internal standards | 28/04/2012 | Corrosion control by inhibitors |
| 51 | SWETHA N | Rearrangement reactions in mass spectrometry | 28/04/2012 | Spectral and magnetic properties of f-block elements |
| 52 | Umesha D. C. | General methods of fragmentation in MS | 05/05/2012 | Calibration by standard-addition methods – Single-point and multi-point addition procedures |
| 53 | Vamsi Krishna Penmatsa | Calibration with external standards – Use of single and multi-point standards | 05/05/2012 | Anisotropic effect (including in annulenes) |
| 54 | VANDANA C | Calibration – Use of external standards and the method of least squares | 05/05/2012 | Simplification of non-first order spectra into first order spectra |
| 55 | Vasantha Kumar B. C. | Spectral and magnetic properties of f-block elements | 05/05/2012 | Basics and applications of $^{31}P$ NMR in inorganic metal complexes |
| 56 | Vinay Kumar K. S. | Calibration by standard-addition methods – Single-point and multi-point addition procedures | 05/05/2012 | Spin-spin decoupling |

| | | | | |
|---|---|---|---|---|
| 57 | YAMUNA T. S. | Polymorphism and pseudopolymorphism | 05/05/2012 | Rearrangement reactions in mass spectrometry |

**Note:** Seminars will be held in Lecture Hall – II

*: Last date to submit the assignment is ***on or before 31st March 2012***

Chairman