**MUFFAKHAM JAH COLLEGE OF ENGINEERING & TECHNOLOGY**

**DEPARTMENT OF CHEMISTRY**

**COURSE HAND–OUT (BE I-SEM 2024-2025)**

**Course Code : BS 204 CH**

**Course Title : ENGINEERING CHEMISTRY**

**Class : B.E. I-SEM CSE DIV-2**

**Contact Hours per Week : 3Theory + 1Tutorial (CREDITS - 4)**

**Course Coordinator : Dr. P GEETHA SWARUPA**

**Module coordinator : Dr. V SHANTHI**

**Course Coordinator e-mail : geetha.swarupa@mjcollege.ac.in**

**Course Coordinator resource link http://mjcollege.ac.in/studentresourceslist.php?resourceusername=geethaswarupa**

**Mobile : 9908039413**

**Location : Room no. 4105**

**Availability : Monday, Wednesday 2:00 – 4:00 pm**

**Pre-requisite Courses:**

To successfully complete this course students should possess minimum knowledge of basic concepts of electrochemistry, types of Polymers; redox reactions, as per the intermediate curriculum. They should also have knowledge to solve numerical problems.

**Course Description:**

The subject introduces the concept of electrochemistry, water analysis and water treatment, Polymers, fuels, principles of green chemistry, spectroscopy and their applications.

At the end of the course students will strengthen fundamentals of material chemistry to build an interface of theoretical concept with their engineering applications. Students will understand the parameter of water quality. Computer Engineers will be able to develop software including simulation software required for making instruments, circuits, manufacture of materials and also helps to design processes for e-waste management.

They shall apply the properties of polymers and spectroscopy knowledge to develop and design ecofriendly machineries, automobile engines and engineering materials.

**Course Outcomes:**

On successful completion of this course, students will be able:

1. **Apply** concept of electrode potential in identifying feasibility of electrochemical reaction; **develop** a more in-depth perception on working of various types of batteries and their applications especially in electric vehicles.
2. **Identify** the mechanism of corrosion of materials on the basis of electrochemical approach and devise corrosion control methods; **Estimate** the physical and chemical parameters of quality of water and explain the process of water treatment.
3. **Classify** chemical fuels and grade them through qualitative analysis and

**Acquire** knowledge on environment friendly bio-diesel.

1. **Explain** the influence of chemical structure on properties of materials and their choice in engineering applications.
2. **Relate** the concept of green chemistry to **modify** engineering processes and materials;

**Understand** the concepts and applications of spectroscopy.

**Overview of Learning Activities:**

* Class discussions
* Assignment work
* Student seminar

**Overview of Learning Resources:**

1. Prescribed Text Books
2. *Engineering Chemistry*, by P.C.Jain and M.Jain.
3. *Engineering chemistry* by Shashi Chawla, Dhanpat Rai & Sons, New Delhi.
4. *Engineering chemistry* by Balaram Pani, Galgotia Publications, New Delhi.
5. *Engineering chemistry* by O.G.Palanna, TMH, New Delhi.
6. *Principles of Physical chemistry* by Puri & Sharma, S.Chand & Company, New Delhi.
7. *Text book of Physical chemistry* by Bahl & Tuli, S.Chand & Sons, New Delhi.
8. *Engineering chemistry* by Dr. Kishore Palle, Dr.V.Shanthi Scitech Publications
9. *Elementary Organic Spectroscopy* by Y R Sharma.
10. Computer Software : Chem Draw.

**Overview of Assessment:**

1. Benchmark test

2. Class test.

3. Assignments

4. Quiz

5. University exams

**Freely accessible internet sites:**

National Programme on Technology Enhanced learning website

* + <http://nptel.iitm.ac.in>
  + <http://textofvideo.nptel.iitm.ac.in/>
  + <http://vtunotes.vtucampus.com/p/chemistry-cycle-vtu-notes.html>
  + <http://www.nptelvideos.in/2012/11/chemistry-of-materials.html>
  + [http://nptel.ac.in/courses/122101001/21#](http://nptel.ac.in/courses/122101001/21)

**Dr. P GEETHA SWARUPA**  **Dr. V. SHANTHI** Course Coordinator Module Coordinator

**MUFFAKHAM JAH COLLEGE OF ENGINEERING & TECHNOLOGY**

**DEPARTMENT OF CHEMISTRY**

**LAB COURSE HANDOUT (BE I-SEM 2024-2025)**

**Course Code : BS 252 CH**

**Course Title : ENGINEERING CHEMISTRY LAB**

**Class : B.E. I-SEM CSE DIV-2**

**Contact Hours per Week : 3 hours (CREDITS-1.5)**

**Course Coordinator : Dr. P GEETHA SWARUPA**

**Module Coordinator : Dr. V. SHANTHI**

**Course Coordinator Email : geetha.swarupa@mjcollege.ac.in**

**Course Coordinator Phone : 9908039413**

**Course Coordinator Location : Room no. 4105**

**Course Coordinator Availability : Monday, Wednesday 2:00 – 4:00 pm**

**Pre-requisite Courses:**

Students should be able to handle glass apparatus to perform titrations and apply concepts of expressing concentrations of solutions as per 10+2 curriculum.

**Course Description:**

The lab course will acquaint the students to weigh by digital balance for quantitative estimation of iron involving redox titrations. Experiments on estimation of hardness and alkalinity of ground water sample from different areas will familiarize student with water quality parameters. The course will impart necessary skills required for accuracy and also prepare them to use instruments with care. Conduct experiments, take measurements and analyze the data though hands-on experience in order to demonstrate understanding of the theoretical concepts of quantitative Analysis while working in small group. Students can interpret the electro analytical principles with experimental results graphically and demonstratewriting skills through clear laboratory reports.

**Course Outcomes:**

On successful completion of this course, students will acquire the ability to:

1. **Apply** the principles of Colorimetric and Electrochemistry in quantitative estimations.
2. **Estimate** the rate constants of reactions from concentration of reactants/ products as a function of time.
3. **Synthesize** small drug molecules.

**Overview of Learning Activities:**

* Class discussions
* Demonstration
* Experimentation
* Interpretation of results
* Record writing

**Overview of Learning Resources:**

1. Prescribed Text Books
2. A manual of chemistry practical’s by faculty of MJCET.
3. Senior practical physical chemistry. B.D. khosla, A.Gulati, V.C.Garg, R.Chand and company, New Delhi 11th Edition.
4. Laboratory Manual on Engineering chemistry S.K.Bhasin and Sudha Rani, Dhanpath Rai Publishing Company.

**Overview of Assessment:**

1. Class performance.
2. Viva.
3. Record
4. Internal exams.
5. University exams.

**Dr. P GEETHA SWARUPA** **Dr. V. SHANTHI**

Course Coordinator Module Coordinator