



# NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

## DEPARTMENT OF CHEMISTRY

| COURSE PLAN – PART I  |  |                |                                  |
|---|--|----------------|----------------------------------|
| Name of the programme and specialization  | B.Tech. II Semester- Electrical and Electronics Engineering  |                |                                  |
| Course Title  | Chemistry Lab  |                |                                  |
| Course Code   | CHIR12   | No. of Credits | 2                                |
| Course Code of Pre-requisite subject(s)   | Nil  |                |                                  |
| Session   | January 2023   | Section        | B                                |
| Name of Faculty   | Mr. Vishnunarayanan<br>Namboothiri V P   | Department     | Chemistry                        |
| Official Email  | <a href="mailto:404119006@nitt.edu">404119006@nitt.edu</a>   | Telephone No.  | +91-9947964886                   |
| Name of Course Coordinator(s) (if, applicable)  | Dr. Baby Viswambharan/ Dr. Sarthak Mandal  |                |                                  |
| Official E-mail   | <a href="mailto:babv@nitt.edu">babv@nitt.edu</a><br><a href="mailto:smandal@nitt.edu">smandal@nitt.edu</a> | Telephone No.  | +91-8547193736<br>+91-8158805377 |
| Course Type (please tick appropriately)   | <input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course                   |                |                                  |
| <b>Syllabus (approved in BoS)</b>   |  |                |                                  |
| <b>LIST OF EXPERIMENTS</b>  |  |                |                                  |
| 1. Estimation of carbonate, non-carbonate and total hardness in the given water sample.                               |  |                |                                  |
| 2. Estimation of dissolved oxygen in the given water sample.  |  |                |                                  |
| 3. Determination of the percentage of Fe in the given steel sample.   |  |                |                                  |
| 4. Estimation of Fe <sup>3+</sup> by spectrophotometer.   |  |                |                                  |
| 5. Corrosion rate by polarization technique   |  |                |                                  |
| 6. Conductometric titration   |  |                |                                  |
| 7. Potentiometric titration   |  |                |                                  |
| 8. pH-metric titration  |  |                |                                  |
| 9. Percentage purity of bleaching powder  |  |                |                                  |
| 10. Determination of molecular weight of the polymer by Viscometry  |  |                |                                  |
| 11. Study of three-component system.  |  |                |                                  |
| 12. Demonstration experiments using Advanced Spectroscopic Techniques, (UV-Vis, FTIR,                                 |  |                |                                  |
| 13. Raman)  |  |                |                                  |
| <b>Reference Books</b>  |  |                |                                  |
| 1. Laboratory Manual, Department of Chemistry, National Institute of Technology, Tiruchirappalli.                     |  |                |                                  |
| 2. S.K. Bhasin, S. Rani, Laboratory Manual on Engineering Chemistry, Dhanpat Rai Publishing Company, New Delhi, 2011. |  |                |                                  |
| 3. Virtual Lab-Online platform for Laboratory experiments   |  |                |                                  |



# NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

## COURSE OBJECTIVES

To introduce the student's the experiments on (i) estimation of total hardness and (ii) dissolved oxygen in a given water sample, (iii) determination of the percentage of Fe in the given steel sample, (iv) estimation of  $\text{Fe}^{3+}$  by spectrophotometer, (v) determination of corrosion rate by polarization technique, (vi) conductometric titration, (viii) potentiometric titration, (viii) pH-metric titration, (ix) determination of percentage purity of bleaching powder, (x) determination of molecular weight of the polymer by viscometry.

## MAPPING OF COs with POs

| Course Outcomes  | Programme Outcomes (PO)<br>(Enter Numbers only) |
|--|---|
| <ul style="list-style-type: none"> <li>The chemistry laboratory course will consist of experiments illustrating the principles of chemistry relevant to the study of science and engineering.</li> <li>The students will learn how to estimate various components from the corresponding bulk mixture</li> </ul> | 1, 2, 12  |

## COURSE PLAN – PART II

### COURSE OVERVIEW

This is a 2 credit course offered to I year B.Tech students. One lab session (3 h) will be conducted per week. Students will perform experiments illustrating the principles of chemistry relevant to the study of science and engineering and will learn how to estimate various components from the corresponding bulk mixture.

### COURSE TEACHING AND LEARNING ACTIVITIES (Add more rows)

| S.No | Week/Contact Hours                          | Topic  | Mode of Delivery |
|------|---|--|------------------|
| 1    | III week of March 2023                      | Introduction of apparatus, General Instructions and guidelines regarding lab Safety and Conduct, Demonstration of experiments and Theory numerical elaboration   | Experiment       |
| 2    | IV week of March 2023 – I week of June 2023 | <ol style="list-style-type: none"> <li>1. Conductometric titration.</li> <li>2. Potentiometric titration.</li> <li>3. pH-metric titration.</li> <li>4. Percentage purity of bleaching powder.</li> <li>5. Determination of molecular weight of the polymer by Viscometry.</li> </ol> | Experiment       |



# NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

|   |                      |   |            |
|---|----------------------|---|------------|
|   |                      | 6. Estimation of carbonate, non-carbonate and total hardness in the given water sample.<br>7. Estimation of dissolved oxygen in the given water sample.<br>8. Determination of the percentage of Fe in the given steel sample.<br>9. Estimation of $Fe^{3+}$ by spectrophotometer.<br>10. Corrosion rate by polarization technique. |            |
| 3 | II week of June 2023 | Compensatory Lab Test   | Experiment |

## COURSE ASSESSMENT METHODS (shall range from 4 to 6)

| S.No              | Mode of Assessment   | Week/Date  | Duration | % Weightage              |
|-------------------|--|--|----------|--------------------------|
| <b>Practicals</b> |  |  |          |                          |
| 1                 | Assessment 1<br>(Based on individual experiments done during lab sessions) | IV week of March 2023<br>to<br>I week of June 2023 | 3 h/week | 40                       |
| 2                 | Assessment 2<br>(MCQ)  | II week of June 2023                               | 30 min   | 20                       |
| 3                 | Final Assessment-<br>Assessment 3<br>(Experiment and Viva)                 | III week of June 2023                              | 3 hours  | 40                       |
|                   |  |  |          | <b>Total (100 Marks)</b> |

## COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

1. Feedback from students during class committee meetings
2. Anonymous feedback through a questionnaire at the end of the semester.

## MODE OF CORRESPONDENCE (email/ phone etc)

E-mail: [404119006@nitt.edu](mailto:404119006@nitt.edu) / Phone: +91-9947964886

## COMPENSATION ASSESSMENT POLICY

For those students who missed assessment 2 due to genuine reasons, the Compensation assessment will be conducted during II week of June 2023.



## NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

### ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

### ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero marks to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the programmes.

### ADDITIONAL INFORMATION, IF ANY

The respective faculty will be available for consultation at times as per the intimation by the faculty.

### FOR APPROVAL

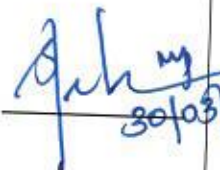
Course Faculty

  
29-03-2023

CC- Chairperson

S. KAYALVIZHI  
29/03/23

HOD

  
30/03/23



# NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

## Guidelines

- The number of assessments for any theory course shall range from 4 to 6.
- Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.
- One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.
- The passing minimum shall be as per the regulations.

| B.Tech. Admitted in                            |      |  |                                | P.G. |
|--|------|--|--------------------------------|------|
| 2019   | 2018 | 2017   | 2016                           |      |
| 35% or (Class average/2) whichever is greater. |      | (Peak/3) or (Class Average/2) whichever is lower | (Class average/2) whichever is | 40%  |

- Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.
- Absolute grading policy shall be incorporated if the number of students per course is less than 10.
- Necessary care shall be taken to ensure that the course plan is reasonable and is objective.