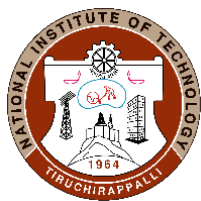




DEPARTMENT OF CHEMISTRY

| COURSE PLAN – PART I   |  |                |                |
|--|--|----------------|----------------|
| Name of the programme and specialization   | B. Tech. (Chemical Engineering (CL) -1 <sup>st</sup> Sem                                 |                |                |
| Course Title   | Chemistry (Lab)  |                |                |
| Course Code  | CHIR12   | No. of Credits | 2              |
| Course Code of Pre-requisite subject(s)  | Nil  |                |                |
| Session  | July 2021  | Section        | n/a            |
| Name of Faculty  | Dr. Lipeeka Rout   | Department     | Chemistry      |
| Official Email   | <a href="mailto:lpeeka@nitt.edu">lpeeka@nitt.edu</a>                                     | Telephone No.  | +91-9178853284 |
| Name of Course Coordinator(s) (if, applicable)   | Dr. Lipeeka Rout   |                |                |
| Official E-mail  | <a href="mailto:lpeeka@nitt.edu">lpeeka@nitt.edu</a>                                     | Telephone No.  | +91-9178853284 |
| Course Type (please tick appropriately)  | <input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course |                |                |
| Syllabus (approved in BoS)   |  |                |                |
| <b>LIST OF EXPERIMENTS</b> <ol style="list-style-type: none"> <li>1. Estimation of carbonate, non-carbonate and total hardness in the given water sample.</li> <li>2. Estimation of dissolved oxygen in the given water sample.</li> <li>3. Determination of the percentage of Fe in the given steel sample.</li> <li>4. Estimation of Fe<sup>3+</sup> by spectrophotometer.</li> <li>5. Corrosion rate by polarization technique</li> <li>6. Conductometric titration</li> <li>7. Potentiometric titration</li> <li>8. pH-metric titration</li> <li>9. Percentage purity of bleaching powder</li> <li>10. Determination of molecular weight of the polymer by Viscometry</li> <li>11. Study of three component system.</li> <li>12. Demonstration experiments using Advanced Spectroscopic Techniques, (UV-Vis, FTIR, Raman)</li> </ol> |  |                |                |
| <b>Reference Books</b> <ol style="list-style-type: none"> <li>1. Laboratory Manual, Department of Chemistry, National Institute of Technology, Tiruchirappalli.</li> <li>2. S.K. Bhasin, S. Rani, Laboratory Manual on Engineering Chemistry, Dhanpat Rai Publishing Company, New Delhi, 2011.</li> <li>3. Virtual Lab-Online platform for Laboratory experiments</li> </ol>   |  |                |                |
| COURSE OBJECTIVES  |  |                |                |



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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> | 2, 9, 14  |

### COURSE PLAN – PART II

#### COURSE OVERVIEW

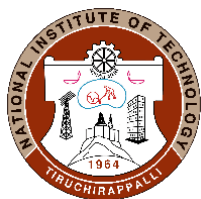
This is a 2 credit course offered to I year B.Tech students. One lab session (3 h) will be conducted per week. Students will perform experiments illustrating the principles of chemistry relevant to the study of science and engineering and will learn how to estimate various components from the corresponding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

#### COURSE TEACHING AND LEARNING ACTIVITIES

( Add more

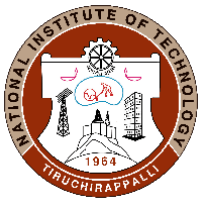
rows)

| S.No | Week/Contact Hours                       | Topic   | Mode of Delivery                             |
|------|--|---|--|
| 1    | I week of Jan 2022                       | Introduction of apparatus, General Instructions and guidelines regarding lab Safety and Conduct, Demonstration of experiments and Theory numerical elaboration  | Teams and Virtual Lab                        |
| 2    | II week of Jan 2022 –<br>I week of March | <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> <li>6. Estimation of carbonate, non-carbonate and total hardness in the given water sample.</li> <li>7. Estimation of dissolved oxygen in the given water sample.</li> </ol> | Teams and Virtual Lab and other online modes |



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|  |   | 8. Determination of the percentage of Fe in the given steel sample.<br>9. Estimation of Fe <sup>3+</sup> by spectrophotometer.<br>10. Corrosion rate by polarization technique.<br>11. Study of three component system.<br>12. Demonstration experiments using Advanced Spectroscopic Techniques, (UV-Vis, FTIR, Raman) |          |             |
|--|---|---|----------|-------------|
| 3.   | II week of March 2022   | Compensatory lab Test   | ”        |             |
| <b>COURSE ASSESSMENT METHODS</b> (shall range from 4 to 6)   |   |   |          |             |
| S.No   | Mode of Assessment  | Week/Date   | Duration | % Weightage |
| <b>Theory</b>  |   |   |          |             |
| 1  | Assessment 1<br>(based on individual experiments done during online lab sessions) | I week of January to<br>I week of March   | 3 h/week | 60          |
| 2  | Final Assessment<br>(MCQ/VIVA)  | II week of March  | 3 hours  | 40          |
| <b>Total (100 Marks)</b>   |   |   |          |             |
| <b>COURSE EXIT SURVEY</b> (mention the ways in which the feedback about the course shall be assessed)  |   |   |          |             |
| 1. Feedback from students during class committee meetings<br>2. Anonymous feedback through questionnaire at the end of the semester.   |   |   |          |             |
| <b><u>MODE OF CORRESPONDENCE (email/ phone etc)</u></b>  |   |   |          |             |
| E-mail: <a href="mailto:lipeeka@nitt.edu">lipeeka@nitt.edu</a> / Phone: +91-9178853284   |   |   |          |             |
| <b><u>COMPENSATION ASSESSMENT POLICY</u></b>   |   |   |          |             |
| For those students who missed assessment 1 due to genuine reasons, Compensation assessment will be conducted during II week of March.  |   |   |          |             |
| <b><u>ATTENDANCE POLICY</u></b> (A uniform attendance policy as specified below shall be followed)   |   |   |          |             |
| <ul style="list-style-type: none"> <li>➤ At least 75% attendance in each course is mandatory.</li> <li>➤ A maximum of 10% shall be allowed under On Duty (OD) category.</li> </ul> |   |   |          |             |



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- 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 mark 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 Kipeeka Raut CC- Chairperson S. Saradaman HOD Abhishek