

## 1. Course Description

| COURSE DESCRIPTION FORM                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| Course Code and Title                                                            | CHE392 CHEMICAL ENGINEERING LABORATORY I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Course Semester                                                                  | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Catalog Description (Content) of the Course                                      | Laboratory applications of Physical chemistry, fluid mechanics and heat transfer principles. Evaluation of experimental data and results. Written presentation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Main Textbook                                                                    | Handouts prepared by the instructor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Supporting Textbooks                                                             | <ol style="list-style-type: none"> <li>1. Related text books.</li> <li>2. All the library and internet Web sources</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Course Credit (ECTS)                                                             | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Prerequisites of the Course<br>(Compulsory attendance should be indicated here.) | There is no prerequisite or co-requisite for this course..                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Type of the Course                                                               | Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Instruction Language of the Course                                               | English                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Object and Target of the Course                                                  | <ul style="list-style-type: none"> <li>• Acquisition of ability to apply background knowledge about fluid mechanics, physical chemistry and heat transfer by experiments.</li> <li>• Acquisition of experience by performing and designing experiments independently .</li> <li>• Analysis of experimental data and learning methods of evaluation.</li> <li>• Application and instruction of safety rules during experiments in the lab.</li> <li>• To gain experience about group study.</li> <li>• To gain written communication skills by preparation of lab reports.</li> </ul>                                                                                                                                 |
| Learning Outcomes of the Course                                                  | <ol style="list-style-type: none"> <li>1. Bench scale experimental set-up construction, hands-on experience with laboratory work.</li> <li>2. Guidelines and safety concepts for laboratory works.</li> <li>3. To examine experimental data, interpret the results, gain report preparation technique.</li> <li>4. Work as a team member.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                 |
| Mode of Delivery                                                                 | The mode of delivery of this course is face to face                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Weekly Schedule of the Course                                                    | <ol style="list-style-type: none"> <li>1. Week: General information about the laboratory</li> <li>2. Week: Team work principles and formation of teams, Laboratory Safety, Waste Management, Data Analysis, Report Writing</li> <li>3. Week: Phase equilibrium</li> <li>4. Week: Phase equilibrium</li> <li>5. Week: Thermodynamic property determination</li> <li>6. Week: Thermodynamic property determination</li> <li>7. Week: Surface chemistry</li> <li>8. Week: Surface chemistry</li> <li>9. Week: Fluid mechanics</li> <li>10. Week: Fluid mechanics</li> <li>11. Week: Heat transfer</li> <li>12. Week: Heat transfer</li> <li>13. Week: Chemical kinetics</li> <li>14. Week: Chemical kinetics</li> </ol> |

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| <b>Educative Activities</b><br>(Credit will be determined based on the time given for these activities. Should be filled carefully.) | Theoretical Study Hours of Course Per Week<br>Practicing Hours of Course Per Week<br>Searching in Internet and Library<br>Preparing Reports<br>Mid-Term and Studying for Mid-Term<br>Final and Studying for Final |                                                                                                                                                                                                                       |                  |                               |                                  |   |                                   |   |   |   |
| <b>Assessment Criteria</b>                                                                                                           |                                                                                                                                                                                                                   | <b>Quantity</b>                                                                                                                                                                                                       |                  | <b>Total Contribution (%)</b> |                                  |   |                                   |   |   |   |
|                                                                                                                                      | Midterm                                                                                                                                                                                                           | 1                                                                                                                                                                                                                     |                  | 10                            |                                  |   |                                   |   |   |   |
|                                                                                                                                      | Homework                                                                                                                                                                                                          |                                                                                                                                                                                                                       |                  |                               |                                  |   |                                   |   |   |   |
|                                                                                                                                      | Assignment                                                                                                                                                                                                        | 5                                                                                                                                                                                                                     |                  | 30                            |                                  |   |                                   |   |   |   |
|                                                                                                                                      | Projects                                                                                                                                                                                                          |                                                                                                                                                                                                                       |                  |                               |                                  |   |                                   |   |   |   |
|                                                                                                                                      | Practice                                                                                                                                                                                                          |                                                                                                                                                                                                                       |                  |                               |                                  |   |                                   |   |   |   |
|                                                                                                                                      | Quiz                                                                                                                                                                                                              | 5                                                                                                                                                                                                                     |                  | 20                            |                                  |   |                                   |   |   |   |
|                                                                                                                                      | Contribution of In-term Studies to Overall Grade                                                                                                                                                                  |                                                                                                                                                                                                                       |                  | 60                            |                                  |   |                                   |   |   |   |
|                                                                                                                                      | Contribution of Final Examination to Overall Grade                                                                                                                                                                |                                                                                                                                                                                                                       |                  | 40                            |                                  |   |                                   |   |   |   |
|                                                                                                                                      | Attendance                                                                                                                                                                                                        |                                                                                                                                                                                                                       |                  |                               |                                  |   |                                   |   |   |   |
| <b>Workload of the Course</b>                                                                                                        | <b>Activity</b>                                                                                                                                                                                                   |                                                                                                                                                                                                                       |                  | <b>Total Week Count</b>       | <b>Weekly Duration (in hour)</b> |   | <b>Total Workload in Semester</b> |   |   |   |
|                                                                                                                                      | Theoretical Study Hours of Course Per Week                                                                                                                                                                        |                                                                                                                                                                                                                       |                  | 14                            | 1                                |   | 14                                |   |   |   |
|                                                                                                                                      | Practicing Hours of Course Per Week                                                                                                                                                                               |                                                                                                                                                                                                                       |                  | 14                            | 3                                |   | 42                                |   |   |   |
|                                                                                                                                      | Reading                                                                                                                                                                                                           |                                                                                                                                                                                                                       |                  | 0                             | 0                                |   | 0                                 |   |   |   |
|                                                                                                                                      | Searching in Internet and Library                                                                                                                                                                                 |                                                                                                                                                                                                                       |                  | 5                             | 2                                |   | 10                                |   |   |   |
|                                                                                                                                      | Designing and Applying Materials                                                                                                                                                                                  |                                                                                                                                                                                                                       |                  | 0                             | 0                                |   | 0                                 |   |   |   |
|                                                                                                                                      | Preparing Reports                                                                                                                                                                                                 |                                                                                                                                                                                                                       |                  | 5                             | 3                                |   | 15                                |   |   |   |
|                                                                                                                                      | Preparing Presentation                                                                                                                                                                                            |                                                                                                                                                                                                                       |                  | 0                             | 0                                |   | 0                                 |   |   |   |
|                                                                                                                                      | Presentation                                                                                                                                                                                                      |                                                                                                                                                                                                                       |                  | 0                             | 0                                |   | 0                                 |   |   |   |
|                                                                                                                                      | Mid-Term and Studying for Mid-Term                                                                                                                                                                                |                                                                                                                                                                                                                       |                  | 1                             | 5                                |   | 5                                 |   |   |   |
|                                                                                                                                      | Final and Studying for Final                                                                                                                                                                                      |                                                                                                                                                                                                                       |                  | 1                             | 10                               |   | 10                                |   |   |   |
|                                                                                                                                      | Other                                                                                                                                                                                                             |                                                                                                                                                                                                                       |                  | 0                             | 0                                |   | 0                                 |   |   |   |
|                                                                                                                                      | Total work load                                                                                                                                                                                                   |                                                                                                                                                                                                                       |                  |                               |                                  |   | 96                                |   |   |   |
|                                                                                                                                      | Total work load/25                                                                                                                                                                                                |                                                                                                                                                                                                                       |                  |                               |                                  |   | 3.84                              |   |   |   |
|                                                                                                                                      | ECTS of the course                                                                                                                                                                                                |                                                                                                                                                                                                                       |                  |                               |                                  |   | 4                                 |   |   |   |
|                                                                                                                                      | <b>Course's Contribution To Program</b>                                                                                                                                                                           | Number                                                                                                                                                                                                                | Program Outcomes |                               |                                  |   | 1                                 | 2 | 3 | 4 |
| 1                                                                                                                                    |                                                                                                                                                                                                                   | Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems. |                  |                               |                                  |   |                                   | X |   |   |
| 2                                                                                                                                    |                                                                                                                                                                                                                   | Ability to identify, formulate, and solve complex engineering problems; ability to select and apply                                                                                                                   |                  |                               |                                  | X |                                   |   |   |   |

