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| 1. Course Name:                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Traffic Engineering</b>                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. Course Code:                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| CIV31206                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. Semester / Year:                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>semester</b>                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. Description Preparation Date:                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>1-9-2025</b>                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. Available Attendance Forms:                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Weekly (Theory: 2hours, Tutorial: 1 hours)</b>                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 6. Number of Credit Hours (Total) / Number of Units (Total)         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| ECTS/4                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 7. Course administrator's name (mention all, if more than one name) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Name: Dr. Adil N. Abed</b>                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Email: adil.abed@muc.edu.iq</b>                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 8. Course Objectives                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Course Objectives</b>                                            | <p>This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programmed specification.</p> <p>Gaining the knowledge and skills related to traffic engineering data analysis and take the engineering decision based on the theories and equations related to traffic engineering</p> |
| 9. Teaching and Learning Strategies                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Strategy</b>                                                     | <p>1.being introduced to the theories and methods used in traffic engineering</p> <p>2.represent and analysis data related to traffic engineering</p> <p>3. Design of roads based on theories and standards related to traffic engineering</p> <p>4. making engineering decision in case of existing of engineering problem or building of new roads based on the previous points</p>                                                                                                                                                              |

| 1. Course Structure |                          |                                           |                                                                                  |                 |                    |
|---------------------|--------------------------|-------------------------------------------|----------------------------------------------------------------------------------|-----------------|--------------------|
| Week                | Hours                    | Required Learning Outcomes                | Unit or subject name                                                             | Learning method | Evaluation method  |
| Week 1              | <b>Th.:2<br/>tut.: 1</b> | Principle of Traffic                      | Introduction to Traffic Engineering: Definition and scope of traffic engineering | Lect. & tut     | Quiz<br>H.W Report |
| Week 2              | <b>Th.:2<br/>tut.: 1</b> | Road User Characteristics                 | Characteristics of driver                                                        | Lect. & tut     | Quiz<br>H.W report |
| Week 3              | <b>Th.:2<br/>tut.: 1</b> | Road User Characteristics                 | Characteristics of vehicles                                                      | Lect. & tut     | Homework           |
| Week 4              | <b>Th.:2<br/>tut.: 1</b> | Traffic Stream Parameters                 | Fundamental traffic flow parameters (density, flow, speed)                       | Lect. & tut     | Exam<br>report     |
| Week 5              | <b>Th.:2<br/>tut.: 1</b> | Traffic Stream Parameters(speed)          | Type of speed and data collection                                                | Lect. & tut     | Quiz               |
| Week 6              | <b>Th.:2<br/>tut.: 1</b> | Speed and Travel Time                     | Time mean speed, Space mean speed<br>Spot speed calculation                      | Lect. & tut     | H.W report         |
| Week 7              | <b>Th.:2<br/>tut.: 1</b> | Speed and Travel Time                     | Design speed, operation speed.                                                   | Lect. & tut     | Exam               |
| Week 8              | <b>Th.:2<br/>tut.: 1</b> | Traffic volume<br>Rate of flow<br>Density | ADT, AADT design<br>hourly volume<br>PHF ,jam density                            | Lect. & tut     | Quiz H.W<br>report |
| Week 9              | <b>Th.:2<br/>tut.: 1</b> | Traffic stream models                     | Traffic flow models (macroscopic and microscopic)models                          | Lect. & tut     | Exam               |
| Week 10             | <b>Th.:2<br/>tut.: 1</b> | Shock wave in traffic stream              | Type of Schock wave<br>Bottle neck , stopped traffic and queuing.                | Lect. & tut     | H.W report         |
| Week 11             | <b>Th.:2<br/>tut.: 1</b> | Intersections and Traffic signal design   | Type of intersection<br>Time separation, space Separation, traffic signa design  | Lect. & tut     | Quiz               |
| Week 12             | <b>Th.:2<br/>tut.: 1</b> | Highway capacity And LOS                  | Capacity calculation<br>Multi lane and free way<br>Level of service.             | Lect. & tut     | Homework           |
| Week 13             | <b>Th.:2<br/>tut.: 1</b> | Parking                                   | Parking survey and demand, type of parking<br>Parking supply and design          | Lect. & tut     | Exam               |

|         |                          |        |                                        |             |        |
|---------|--------------------------|--------|----------------------------------------|-------------|--------|
| Week 14 | <b>Th.:2<br/>tut.: 1</b> |        | Mid term exam.                         |             | Exam.  |
| Week 15 | <b>Th.:2<br/>tut.: 1</b> | Review | Preparatory week before the final Exam | Lect. & tut | report |

## 2. Course Evaluation

**The grade distribution is as follows:**

**Assessment: Formative 40 marks Midterm exam 10 marks**

**Final exam: Theory 50 marks.**

## 3. Learning and Teaching Resources

|                                                                    |                                                                                                                                                                                                                                                                                         |
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| Required textbooks (curricular books any)                          | <ul style="list-style-type: none"> <li>• Highway Capacity Manual, (2010), (2000) (HCM),</li> <li>• Kadiyali, (2010) "Traffic Engineering and Transport Planning".</li> <li>• Khisty, C. J. and B. K. Lall (2016). Transportation Engineering an introduction, Pearson India.</li> </ul> |
| Main references (sources)                                          | Garber, Nicholas, J. and Lester A. Hoel. Traffic and Highway                                                                                                                                                                                                                            |
| Recommended books and references (scientific journals, reports...) | -IEEE Transactions on Intelligent Transportation Systems<br>Focus: AI, sensors, autonomous vehicles, traffic control systems.<br>-Journal of Transportation Engineering (ASCE)                                                                                                          |
| Electronic References, Websites                                    | <a href="https://colliersengineering.com/services/transportation-traffic/traffic-engineering/">https://colliersengineering.com/services/transportation-traffic/traffic-engineering/</a>                                                                                                 |

## Course Description Form

