**College of Engineering**

**Department of Civil Engineering**

# CE 540 Intelligent Transportation Systems

| | |
|---|---|
| **Credit and Contact hours** | 3 / 3 (Lectures), 0 (Tutorials), 0 (Laboratory) |
| **Required, or Elective** | Elective |
| **Course Description** | This course aims to introduce students to the fundamentals of intelligent transportation systems (ITS), focusing on technologies and systems. Topics include: advanced traveler information systems, transportation network operations, public transportation applications, ITS and safety, cooperative ITS, and ITS and mobility. <br><br> The mobility of the people has become the prevalent element of everyday life, as the roads and parking become more crowded, the investment in the infrastructure focuses more on the use of intelligence rather than on the basic infrastructure, as the basic infrastructure built for the maximum capacity becomes unused for the most of the time, and achieve its full return on investment only in the peak hours, while outside of the peak hours its capacity is heavily underutilized. <br><br> Intelligent Transport Systems (ITS) use electronics, information and communications technologies to deliver transport improvements instead of extending physical infrastructure, thereby saving money, reducing costs, increasing return on investment while at the same time reducing environmental impact. |
| **Prerequisites or Co-requisites** | None |

**Course Learning Outcomes**

Students completing this course successfully will be able to:

| Course Learning Outcomes (CLOs) | Related Student Outcomes (SO) |
|---|---|
| **CLO1.** Recognize the fundamentals of ITS. K1 | **SO1** |
| **CLO2.** Identify the project management principles of ITS. K1 | **SO1** |
| **CLO3.** Develop a simulated environment to solve real-life problems with Intelligent Transport Systems (ITS). S1 | **SO2** |
| **CLO4.** Evaluate different scenarios using ITS methodology for a given problem. S2 | **SO3** |
| **CLO5.** Illustrate scientific integrity and ethical responsibility the using ITS on solving real-life problems. V1 | **SO6** |

| | |
|---|---|
| **Student Outcomes related to this Course** | SO 1 Recognize advanced engineering knowledge, concepts, and techniques to identify, interpret, and analyze complex and real-life engineering problems.<br>SO 2 Provide solutions for complex and real-life engineering problems through critical thinking and the use of modern engineering tools, and identify their impact on social, global, cultural, environmental, safety, and economic factors.<br>SO 3 Investigate scientific research problems independently or through teamwork using critical thinking, appropriate techniques, advanced tools, and management principles.<br>SO 6 Demonstrate scientific integrity, ethical responsibility, and academic values in scientific publications, research projects, and thesis work. |
| **Topics Covered** | **List of Topics** — **Related CLOs**<br>1. Introduction to ITS — **CLO 1**<br>2. Intelligent Transport Systems (ITS) architecture and Standards — **CLO 1-2**<br>3. Principles and methods of Intelligent Transport Systems (ITS) application — **CLO 1-3**<br>4. ITS Highway Safety Perspective — **CLO 1-4**<br>5. Connected Vehicle Technology and Applications — **CLO 1**<br>6. Intelligent Transport Systems (ITS) and traffic simulation — **CLO 2-4**<br>7. Advanced Transportation Management Systems (ATMS) — **CLO 1,3**<br>8. Advanced Traveler Information Systems (ATIS) — **CLO 3,4**<br>9. ITS Policy Issues — **CLO 3,4**<br>10. Case Studies — **CLO 3-5** |
| **Textbook(s) and Other Required Material** | • Sussman, Joseph. Perspectives on Intelligent Transportation Systems (ITS). New York, NY: Springer, 2010.<br>• Mashrur A. Chowdhury, and Adel Sadek, Fundamentals of Intelligent Transportation Systems Planning, Artech House, Inc., 2003. |
| **Grading System** | Weekly quiz/Assignments — 10%<br>Field trip Reports — 20%<br>Research Project/Term Paper — 30%<br>Final Exam — 40% |
| **Instructors** | Dr. Mohammed Hamad O Almannaa |
| **Date of Review** | November, 2024 |