



## **Master of Science in Engineering with emphasis in Railroad Engineering**

In cooperation with the Transportation Technology Center, Inc. (TTCI), the Department of Engineering at Colorado State University-Pueblo (CSU-Pueblo), offers the **Master of Science in Engineering with emphasis in railroad engineering**.

The 33-credit hour program has a 14-credit core, including **four core courses in railroad engineering** taught by **TTCI personnel**:

- **EN 511 Structural engineering.** Fundamental factors in designing the rail road track, crossings, and bridges along with the understanding in controlling the response of structures under dynamic loading. Application of the International Building Code. Taught by **Stephen Dick**. Dr. Dick is an expert in railway bridge loadings and their effects as it relates to overall deterioration of structures and fatigue life of steel bridges.
- **EN 532 Railroad power systems.** Comprehensive analysis and design of electric power systems for railroads including power supplies, AC/DC and linear motors, third rails, catenaries, and substations/distribution systems. Taught by **Richard L. Morgan**. Mr. Morgan has over 35 years experience in designing, developing, testing, and operating major complex systems in the US Air Force, BDM Corporation, SAIC, and, currently, TTCI.
- **EN 551 Fleet management.** Management of all of the diverse assets held by an organization. Fleet management business and economics, risk analysis, information systems, vehicle planning and control, productivity, safety, and environmental compliance. Taught by **Roy B. Wiley**. Mr. Wiley has 15 years experience in the transportation industry, most at TTCI, where he specializes in vehicle performance monitoring.
- **EN 552 Vehicle dynamics.** Analytical and computer skills to analyze components and entire working assemblies. Kinematic and kinetic dynamic analysis, time and frequency domain simulations of dynamics systems used in vehicles. Taught by **Robert Fries** and **Matt Witte**. With over 40 years of engineering experience and now retired from TTCI, Dr. Fries specializes in the dynamics of road, rail, and off-road vehicles. Dr. Witte has 27 years of Mechanical Systems engineering experience primarily in the automotive industry from Chrysler Group and now at TTCI.

A successful applicant to the MSE program will have a quantitatively based baccalaureate degree from a regionally accredited college or university. Students with non-quantitatively based baccalaureate degrees may be admitted conditionally, but additional prerequisites may be required.

**Students will be required to have the following material as prerequisites:**

- Two semesters of calculus, equivalent to Math 126 and Math 224 at CSU-Pueblo,
- Two semesters of calculus-based physics, equivalent to PHYS 221/221L and 222/222L,
- Computer programming, preferably in Matlab, equivalent to EN 103,
- Engineering mechanics (statics and dynamics), equivalent to EN 211 and 212,
- Electrical circuits, equivalent to EN 231/231L,
- Calculus-based probability and statistics, equivalent to EN 365, and
- Engineering economics or finance, equivalent to EN 343.

Some prerequisite material can be taken after starting the program with a conditional admission.

**The 33-credit degree program has the following components:**

- 2 credits in MS seminar, EN 593. An introduction to philosophical, methodological, and ethical issues in engineering, including engineering research.
- 12 credits in the core topics in the emphasis area, as described above.
- 19 credits in electives. In conjunction with a faculty advisor, the student will select courses to build upon and expand the student's knowledge and skills in support of the student's plans for employment and future graduate study. Students are encouraged to select the thesis option (6 credits), as well as to do industry-based projects. Graduate level engineering coursework is available in: ergonomics, quality control, scheduling and sequencing, simulation, project planning and control, advanced engineering economics, operations research, facility planning and design, operations planning and control, virtual reality, advanced controls, and intelligent robotics. Students can also take graduate level courses from the CSU-Pueblo Hasan School of Business.

**The program can be completed in one calendar year as a full time student.**

**For more information, contact:**

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<http://ceeps.colostate-pueblo.edu/Engineering/Degrees/MSE/Pages/default.aspx>

**To apply, see:**

<http://www.gocsupueblo.com/Admissions/Pages/Apply-Now.aspx>

**The admissions application deadline for Fall 2014 is August 1, 2014.**