

APPLICATION FOR NEW COURSE

1. Submitted by the College of Engineering Date: October 30, 2008

Department/Division proposing course: Civil

2. Proposed designation and Bulletin description of this course:

a. Prefix and Number CE 433

b. Title* Railway Freight & Passenger Operations and Intermodal Transportation

*If title is longer than 24 characters, offer a sensible title of 24 characters or less: Railway Operations

c. Courses must be described by at least one of the categories below. Include number of actual contact hours per week.

() CLINICAL () COLLOQUIUM () DISCUSSION () LABORATORY (X) LECTURE
() INDEPEND. STUDY () PRACTICUM () RECITATION () RESEARCH () RESIDENCY
() SEMINAR () STUDIO () OTHER – Please explain: _____

d. Please choose a grading system: Letter (A, B, C, etc.) Pass/Fail

e. Number of credit hours: 3

f. Is this course repeatable? YES NO If YES, maximum number of credit hours: _____

g. Course description:

Study of the transportation engineering aspects of efficient management of railway operations including freight, passenger, and intermodal transportation.

h. Prerequisite(s), if any:

CE 331 and engineering standing

i. Will this course also be offered through Distance Learning? YES NO

If YES, please check one of the methods below that reflects how the majority of the course content will be delivered:

Internet/Web-based Interactive video Extended campus

3. Supplementary teaching component: N/A or Community-Based Experience Service Learning Both

4. To be cross-listed as: _____ / _____
Prefix and Number printed name Cross-listing Department Chair signature

5. Requested effective date (term/year): Fall / 2009

6. Course to be offered (please check all that apply): Fall Spring Summer

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7. Will the course be offered every year? YES NO

If NO, please explain: _____

8. Why is this course needed?

There is increased focus on providing fuel efficient, environmentally friendly, mass transportation of freight and passenger in this country including intermodal transportation.

9. a. By whom will the course be taught? Dr. Jerry G. Rose

- b. Are facilities for teaching the course now available? YES NO

If NO, what plans have been made for providing them?

10. What yearly enrollment may be reasonably anticipated?

15 to 20 students

11. a. Will this course serve students primarily within the department? Yes No

- b. Will it be of interest to a significant number of students outside the department? YES NO

If YES, please explain.

12. Will the course serve as a University Studies Program course[†]? YES NO

If YES, under what Area? _____

[†]AS OF SPRING 2007, THERE IS A MORATORIUM ON APPROVAL OF NEW COURSES FOR USP.

13. Check the category most applicable to this course:

traditional – offered in corresponding departments at universities elsewhere

relatively new – now being widely established

not yet to be found in many (or any) other universities

14. Is this course applicable to the requirements for at least one degree or certificate at UK? Yes No

15. Is this course part of a proposed new program? YES NO

If YES, please name: _____

16. Will adding this course change the degree requirements for ANY program on campus? YES NO

If YES[†], list below the programs that will require this course:

[†]In order to change the program(s), a program change form(s) must also be submitted.

17. The major teaching objectives of the proposed course, syllabus and/or reference list to be used are attached.

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18. Check box if course is 400G or 500. If the course is 400G- or 500-level, *you must include a syllabus showing differentiation* for undergraduate and graduate students by (i) requiring additional assignments by the graduate students; and/or (ii) the establishment of different grading criteria in the course for graduate students. (See SR 3.1.4)

19. Within the department, who should be contacted for further information about the proposed new course?

Name: Jerry G. Rose Phone: 257-4278 Email: jrose@engr.uky.edu

20. Signatures to report approvals:

September 5, 2008
DATE of Approval by Department Faculty

George E Blandford / George E Blandford
printed name Reported by Department Chair signature

11/20/09
DATE of Approval by College Faculty

RICHARD J. SWEILAND / Richard Sweiland
printed name Reported by College Dean signature

1/19/2010
* DATE of Approval by Undergraduate Council

/
printed name Reported by Undergraduate Council Chair signature

* DATE of Approval by Graduate Council

/
printed name Reported by Graduate Council Chair signature

* DATE of Approval by Health Care Colleges Council (HCCC)

/
printed name Reported by Health Care Colleges Council Chair signature

* DATE of Approval by Senate Council

Reported by Office of the Senate Council

* DATE of Approval by University Senate

Reported by Office of the Senate Council

*If applicable, as provided by the *University Senate Rules*. (<http://www.uky.edu/USC/New/RulesandRegulationsMain.htm>)

COURSE SYLLABUS

CE 433-001

University of Kentucky
Department of Civil Engineering
Jerry G. Rose, OHR 261
257-4278 jrose@engr.uky.edu

Fall Semester 2009
MWF 11:00–11:50 am
OHR 057
www.engr.uky.edu/~jrose

Railway Freight & Passenger Operations and Intermodal Transportation

INSTRUCTION

Dr. Jerry G. Rose, Professor of Civil Engineering, will serve as the primary instructor for the course. Approximately one-half of the course will be devoted to Freight Railway Operations and Management. The other half of the course will be devoted to the emerging growth of the Intermodal Freight and Rail Passenger/Transit Systems. The instruction will be complemented with special speakers, out-of-class tours, and supplementary handout material. It will be offered during the fall semesters.

INTRODUCTION

The course emphasizes the transportation engineering aspects of railway operations – efficient movement of freight and passengers – and complements the existing “Railroad Facilities Design and Analysis” class (CE 533), which is offered in the spring semesters and places emphasis on the engineering aspects of physical railroad facilities. It provides students with instruction in the critical concepts and planning of railway operations. Students are exposed to the processes used for managing local railway operations to managing system-wide operations. The key planning roles of railroad professionals are stressed. Equal emphasis is placed on the increasing reliance on intermodal (multi-modal) freight transportation systems and the reemergence of rail passenger, commuter and transit systems, and their roles for the 21st century. The combined course has been offered for the past two semesters.

EDUCATIONAL OBJECTIVES

The basic teaching objective is to provide civil engineering students with a course emphasizing the transportation aspects of railway freight operations with additional emphasis on our nation’s intermodal freight and rail passenger/transit transportation systems. It will benefit students wishing to pursue engineering employment in the railroad or rail transit industries with a railway company or government agency or a company providing services to the industry, such as a contractor, engineering firm, or supplier.

OUTLINE

- the basic rail route structure,
- maintenance and management of the rail infrastructure and how they affect operations,
- the key roles of the operations management personnel,
- the daily activities involved in line of road, terminal, local, and network operations,
- evaluation and measurement of service design and operations,
- extrapolate the roles of the heavy freight railroad industry and the passenger, commuter, and transit rail systems for the 21st century,
- intermodal freight transportation, and
- mass transit systems

REQUIREMENTS

The textbook is *The Railroad—What It Is, What It Does*, 5th edition by John H. Armstrong.

A compilation of Outline Notes and Power Point Presentation are available.

Various handouts and study materials will be provided, including selected articles from *Railway Age* and *Progressive Railroading* magazines.

Class attendance is extremely important. Grades will be lowered for excessive absenteeism.

Out-of-class assignments normally will be provided weekly by e-mail. These are due the following class session.

One or two field trips are planned to observe railroad and multi-modal operations. Several guest speakers will present lectures.

A term paper and presentation to the class are required.

This course prerequisite is CE 331 and engineering standing. It is expected that students have a basic understanding of transportation engineering and will be able to produce high-quality work.

ENGINEERING ETHICS

It will be assumed that each student subscribes to a professional code of ethics that is the basis for behavior in class. Any and every case where these ethics are violated will be dealt with according to the provisions in the Student Code. **All cellular phones or electronic communication devices must be turned off during examinations. No text messaging permitted.** (Also, see the Undergraduate Study in Civil Engineering Handbook on Student and Faculty Responsibilities.)

GRADING

LETTER GRADE SCALE

Final Grades will be determined from class averages as follows:

25% - Exam I	90 - 100% = A
25% - Exam II	80 - 89% = B
25% - Exam III	70 - 79% = C
10% - Out-of-class Assignments	60 - 69% = D
15% - Term Paper & Presentation	< 60% = E

COURSE DESCRIPTION

Study of the transportation engineering aspects of efficient management of railway operations including freight, passenger, and intermodal transportation.

EDUCATIONAL OUTCOMES

Week	Topic
1	To provide the students with a basic understanding of how the heavy freight railroad and passenger, commuter, and transit rail systems have evolved and their effect on American industry and citizenry; including an analysis of the major objectives of a railroad's operating departments.
2	To provide details on how the rail routes and infrastructure are maintained and the effects of the infrastructure quality on operations; how the maintenance activities are planned and organized and how the quality level is measured.
3 & 4	To enable the student to understand the management, assignment, operation, and maintenance of the motive power and rolling stock; various accounting procedures for measuring efficiency; fleet cycle times; management and efficiency studies of the role of the locomotive engineer and trainmen in inspecting trains and practicing safe job procedures; and management and efficiency studies of the role of the locomotive engineer relative to safe train operating/handling practices, signal indications, safe job and train operation procedures.
5	To enable the student to understand the basics of train operations; laws and rules; generation of timetables, bulletins, and train documents; accident cause/finding; train control and signal systems; roles of the trainmaster.
6 & 7	To enable the student to understand the three types of train operations – <u>line of road operations</u> : management studies of the role of the train dispatcher; innovative tracking techniques; root cause of analysis of operational efficiency; management of <u>terminal operations</u> ; role of the yardmaster; classification and blocking; and management of <u>local operations</u> ; industry service; roles of the industrial development and customer service representatives.
8	To enable the students to analyze network operations; managing locomotives, rolling stock, and crews; routing mixed freight, unit trains and intermodal trains; service design; planning process; measuring productivity; administration; law; accounting; and efficiency measurements.
9 - 12	To enable the students to understand and evaluate the intermodal transportation planning process and the processes and interfaces involved with the various other modes – international ocean shipping, domestic water, and highway.
13 - 14	To provide the student with a basic understanding of the various rail passenger systems – including heavy rail transit, light rail systems, rail commuter service, intercity passenger service, and high speed-rail; role of rail passenger service in this country and comparisons with other countries; demands of passengers and measurements of acceptance; directions of the rail freight and passenger systems for the 21 st century; interdependences of multi-modal systems; and innovations for improving productivity.

LEARNING OUTCOMES

Upon completion of this course, the students will be able to:

- Identify the various facets of the railway freight and passenger systems in the United States,
- Articulate the various operational management aspects of the rail transportation systems,
- Understand railway activities involved in the daily line of road operations, terminal operations, and local operations,
- Identify the processes and interfaces involved with the other transportation modes – international shipping, domestic water, and highway – as an intermodal seamless operation,
- Articulate the various demands and measurements of acceptance for the various rail passenger systems – including heavy rail transit, light rail systems, rail commuter service, intercity passenger service, and high-speed rail,
- Compare railway operations on an international scale with those in the U.S.,
- Assess the changing objectives and requirements necessary for the expansion of the railway industry, including intermodal exchanges, in the U.S. and worldwide during the 21st century, and
- Prepare a technical report relating to a selected aspect of the course and orally present their findings and analyses.