

UNIVERSITY OF MASSACHUSETTS AMHERST  
OFFICE OF THE SECRETARY  
THE FACULTY SENATE

PROGRAM REVISION APPROVAL FORM

50 COPIES REQUIRED

PROGRAM TITLE: Certificate in Transit Management and Operations

PLEASE CHECK: GRADUATE UNDERGRADUATE X

DEPARTMENT: Civil and Environmental Engineering CHAIR: Richard Palmer

SCHOOL OF COLLEGE: Engineering DEAN: Theodore E. Djaferis

Submission Date: Proposed Starting Date: 9-1-12

I. PROPOSAL DEVELOPMENT

Proposing Committee: John Collura, Civil and Environmental Engineering; Donald Fisher, Mechanical and Industrial Engineering; Michael Knodler, Civil and Environmental Engineering; Allan Byam, UMass Transit Services

A. Describe the proposal:

The establishment of an interdisciplinary Certificate in Transit Management and Operations within the Department of Civil and Engineering recognizes the need for an undergraduate level program in Transit Management and Operations. The field of transit management and operations requires a diverse skill set and thus attracts a variety of disciplines. At the University of Massachusetts those most involved in public transportation have been the UMass Transportation Center, Department of Civil and Environmental Engineering, and UMass Transit Services. In particular the Transportation Center and UMass Transit have coordinated on various projects including the Regional Traveler Information Center and in the past it was the Department of Civil Engineering that received the demonstration grant in the 1970's to establish UMass Transit. The Department of Civil Engineering also works closely with the School of Management to offer a dual master's degree program in business and engineering. It is expected that this certificate will also draw involvement from other academic units such as Regional Planning, School of Management and various others. An Advisory Committee has been established for the certificate program and has designed a 15 credit Undergraduate Certificate in Transit Management and Operations that will be open to all Undergraduate students. A detailed governance structure for the Certificate has been created and approved by the Advisory Committee.

B. Provide a brief overview of the process for developing the Proposal:

The concept for a Certificate in Transit Management and Operations began in 2000 when it became apparent that students at UMass Amherst, who were hired as part time bus drivers, were entering into the transit industry with very little education in operations and management but experience in transit. Anecdotal evidence has shown that within the last several years over a dozen former student bus drivers have gone on to work within the transit industry. The formal process to establish an Undergraduate Certificate in Transit Management and Operations began in the Spring of 2011 when UMass Transit Services and the UMass Transportation Center jointly applied for a FTA Workforce Development Grant. They were awarded the grant in July 2011. Upon receiving the grant there were numerous inquiries from the public and transit industry about the certificate program. The industry is extremely excited to have such a program to train and educate students for jobs within the transportation industry while still in college.

## II. PURPOSE AND GOALS

Describe the Proposal's purpose and the particular knowledge and skills to be acquired:

The plan of study will provide rigorous institutional framework as well as internship experience to provide an interdisciplinary approach to undergraduate education in transit management and operations. An integrated approach is vital to the Certificate's overall success. Students will acquire skills and knowledge in management techniques, critical analysis, transit operations, and community engagement which will make them well rounded and verse in public transportation. The academic experience combined with the required internship hours will allow them to apply their learned knowledge to a real life application.

### PART 1: PROPOSAL OVERVIEW

#### Rationale:

The intent of this certificate is to attract and train young, well-educated individuals into the transit industry by introducing them to opportunities in public transportation, while enrolled in college. According to the American Public Transportation Association (APTA) there is a need for young, educated workers as the industries workers age and retire. By 2020 more than half of the transit workforce nationwide will have retired. There is a need to train the next generation as workforce and human capital are critical to the continuing success of the public transportation industry.

At present, no degree in Transit Operations and Management exists at the University of Massachusetts system or any other university in the United States. According to APTA there is a need exists for such a program. The focus of the Certificate in Transit Management and Operations is to introduce individuals to the field of public transportation and provide them with the skill set necessary to become leaders within the industry by drawing upon the numerous resources offered by the University of Massachusetts. The certificate program will encourage undergraduate students to apply an interdisciplinary approach, by stepping outside of their home department, to deliver a high-quality performance that effectively and efficiently responds to the ever evolving needs of public transportation.

It is the aim of this undergraduate certificate to attract individuals from various disciplines and provide them with the educational and practical experience needed, in the form of the certificate program, to become successful in the transportation industry. It draws upon an interdisciplinary and hands on approach by placing students in internship positions to better prepare them for a career in transportation. The certificate will position students to find jobs operations supervisors, transit managers, transportation planners, ITS specialists, general managers and others.

#### Collaborative strategies and partnerships

The proposed program will be a partnership between the Department of Civil and Environmental Engineering (CEE), University of Massachusetts Transportation Center UMass Transit Services and CTTransit. CEE will oversee and administer the certificate. UMass Transit Services and CTTransit will offer internships to those students in the certificate program. These two transit providers will collaborate with the UMass Transportation Center to establish a summer workshop with transit industry professionals.

#### Leadership in interdisciplinary advanced studies

The University of Massachusetts Amherst would be the first university in the United States to offer a Certificate in Transit Management and Operations to undergraduate students. Currently this type of program is available only to professionals in the industry at a limited number of universities, none of which are in New England.

### PART 2: CERTIFICATE PROGRAM GOVERNANCE STRUCTURE

#### Director

- A. The Director shall be appointed by the College of Engineering Dean for a term not exceeding three years, with reappointment possible.
- B. The Director shall be responsible for the oversight and administration of the program.

#### Faculty

- A. The initial Certificate program graduate faculty will be composed of members of the graduate faculty.
- B. The Advisory Committee will ensure that all new faculty have graduate faculty status.
- C. There will be a general meeting of all program faculty and students at least once each semester.

#### Advisory Committee Responsibilities

- A. Advisory Committee members shall have the responsibility of advising the Director on all aspects of the Undergraduate Certificate Program, including establishing standing or ad hoc committees, scheduling, curricular development, faculty appointments and recruitment, budgeting, dissertation proposals and procedures, and sponsorship of extracurricular events.
- B. The Advisory Committee shall serve as a committee of the whole in matters of faculty membership, curriculum, and awards, in lieu of separate standing committees. all actions shall require a majority vote.

- C. The Advisory Committee shall meet at least once a semester at a time to be specified by the Director.
- D. Additional meetings may be called as needed.
- E. Students shall be represented by a member on the Advisory Committee, elected for one year.
- F. Student members of the Advisory Committee may vote on all issues of principle and policy except for the following: appointment to or dismissal of individuals from the faculty, for student eligibility for the certificate, or for fellowship awards.
- G. Students may volunteer for service, or be appointed by the Director to serve, on all ad hoc committees of the Program.

### Students

- A. Undergraduate Certificate Program in Transit Management and Operations students shall be defined as those matriculated undergraduate students whose application for admission to the Certificate Program has been approved by the Advisory Committee and who are pursuing the requirements for the Certificate.

### **PART 3: CERTIFICATE PROGRAM IN TRANSIT MANAGEMENT AND OPERATIONS REQUIREMENTS:**

1. An application to the Advisory Committee.
2. The completion of 15 credits approved by the Advisory Committee including the required courses.
3. Upon completion of the coursework, Certificate students will submit a statement of completion outlining the coursework taken and a summary of their internship experience.
4. The student will need to obtain the signatures of the supervisors they shadowed during the internship to sign off on the completion of hours.
5. The student must have at least a 2.00 GPA in the courses used to satisfy the certificate.
6. The Certificate will be awarded only upon completion of these requirements and by the approval of the Advisory Committee.

### Restrictions:

- A. A maximum of two 3-credit independent study courses may be applied to the Certificate requirement.
- B. A minimum of three approved courses, of at least 3 credits each, must be taken at UMass Amherst.
- C. A student's participation in the certificate program does not guarantee admission to a course. The policies that have been established in each department for course enrollment and registration remain in effect for those courses that contribute to the certificate.
- D. A student may appeal to the Advisory Committee to substitute up to six credits of courses for courses on the elective coursework list.
- E. The student must take at least one class outside of their home department.

## Curriculum Overview

The Certificate in Transit Operations and Management is designed to provide opportunities for students to learn about potential opportunities in the transit industry and provide them with the training necessary to become leasers in the field. The program has a balanced focus on academic course work and internship experience.

### Requirements:

A. Foundation Course: CEE 410 Public Transportation Systems

*This course is offered annually.*

CEE 410 is one of the two core course required for the undergraduate certificate in Transit Management and Operations. The course is an introduction to public transportation systems and focuses on the Relationship of public transportation to technological innovation; financing and regulation; supply, demand, and price considerations; performance evaluation; routing and scheduling; application of microcomputers; and project planning and design.

B. Foundation Course: CEE 418 Intelligent Transportation Systems

*This course is offered annually.*

CEE 418 is the second core course required for the undergraduate certificate in Transit Management and Operations. The course is a critical review and analysis of intelligent transportation systems (ITS) as it applies to the management and operation of surface transportation facilities and the technologies applied.

C. Internship

The student must complete a total of at least 500 internship hours with CTTransit and UMass Transit (or similar size transit agencies). The student is expected to split the 500 hours between UMass Transit and CTTransit with a minimum of 100 hours with each organization. The idea behind splitting the internship hours is for the student to gain experience in both a small and large transit operation. The internship will provide the student with valuable real life experience in the transit field where they will learn the tools and techniques of the trade through observation and participation. During the internship the student will shadow staff members from various departments and assist in projects.

D. Professional Development Workshop

This workshop will be offered each summer. The workshop will be taught by Allan Byam, UMass Director of Transportation Services; David Lee, General Manager CTTransit; John Collura, UMass professor of Civil and Environmental Engineering. It will include a two day classroom workshop and several online training tools such as the Consortium on ITS Education, National Transit Institute, Institute of Transportation Engineers and other education and training groups.

Students, in consultation with the Program Director and/or a member of the Advisory Committee will develop individualized courses of action for the certificate. They must select at least three additional classes from the following list:

Elective Coursework

ACCOUNTG 221	Introduction to Accounting	3cr
ACCOUNTG 311	Business Applications of Computers	3cr
CEE 310	Introduction to Transportation Systems	3cr
CE-ENGIN 496	Independent Study	1-6cr
ENGLISH 379	Introduction to Professional Writing	3cr
FINOPMGT 341	Logistics & Transportation Functions	3cr
FINOPMGT 347	Introduction to Operations Management	3cr
GEO-SCI 492P	Transportation Geography	3cr
LABOR 280	Labor & Work in the US	3cr
MANAGMNT 260	Introduction to Law	3cr
MANAGMNT 301	Principles of Management	3cr
MANAGMNT 314	Human Resource Management	3cr
POLISCI 214	Urban Gov & Politics	3cr
SCH-MGMT 316	Leadership Communication	3cr

**III. RESOURCES NEEDED**

The proposed certificate will require new resources. The professional development workshop with transit professionals will be established. Funding for it will come from a FTA Workforce Development grant that UMass Transit and the UMass Transportation Center jointly received.



