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Graduate Programs—NEW COURSE PROPOSAL ¹

DEPARTMENT: CIVIL, ENVIRONMENTAL AND
 GEOMATICS ENGINEERING

COLLEGE: ENGINEERING AND COMPUTER SCIENCE

RECOMMENDED COURSE IDENTIFICATION:

PREFIX _____ TTE _____ COURSE NUMBER 6259 LAB CODE (L or C) _____

(TO OBTAIN A COURSE NUMBER, CONTACT M.JENNING@FAU.EDU)

COMPLETE COURSE TITLE: **Traffic Signal Systems**

EFFECTIVE DATE

(first term course will be offered)

CREDITS ²: 3

TEXTBOOK INFORMATION: HANDOUTS PROVIDED BY INSTRUCTOR

ISBN:

GRADING (SELECT ONLY ONE GRADING OPTION): REGULAR SATISFACTORY/UNSATISFACTORY _____

COURSE DESCRIPTION, NO MORE THAN THREE LINES: THIS COURSE IS DESIGNED TO TEACH STUDENTS ABOUT ADVANCED CONCEPTS OF TRAFFIC SIGNAL SYSTEMS WHICH ARE CURRENTLY USED IN THE US PRACTICE. STUDENTS WILL BE ABLE TO DESIGN, EVALUATE AND OPTIMIZE VARIOUS COMPONENTS OF TRAFFIC SIGNAL OPERATIONS BOTH FOR INDIVIDUAL INTERSECTIONS AND COORDINATED TRAFFIC SIGNAL SYSTEMS.

PREREQUISITES *: NONE

COREQUISITES*: NONE

REGISTRATION CONTROLS (MAJOR, COLLEGE, LEVEL)*:

* PREREQUISITES, COREQUISITES AND REGISTRATION CONTROLS WILL BE ENFORCED FOR ALL COURSE SECTIONS.

MINIMUM QUALIFICATIONS NEEDED TO TEACH THIS COURSE: PHD IN ENGINEERING OR CLOSELY RELATED FIELDS

Faculty contact, email and complete phone number:
 ALEKSANDAR STEVANOVIC, PH.D.
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 ASTEVANO@FAU.EDU
 (561) 297 3743

Please consult and list departments that might be affected by the new course and attach comments.
³
 No other departments affected.

Approved by:

Department Chair: _____

College Curriculum Chair: _____

College Dean: _____

UGPC Chair: _____

Graduate College Dean: _____

UFS President: _____

Provost: _____

Date:

9/29/14

9/29/14

10/1/14

10/8/14

10-15-14

1. Syllabus must be attached; see guidelines for requirements: www.fau.edu/provost/files/course_syllabus.2011.pdf

2. Review Provost Memorandum: **Definition of a Credit Hour** www.fau.edu/provost/files/Definition_Credit_Hour_Memo_2012.pdf

3. Consent from affected departments (attach if necessary)

Email this form and syllabus to UGPC@fau.edu one week before the University Graduate Programs Committee meeting so that materials may be viewed on the UGPC website prior to the meeting.

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1. Course title/number, number of credit hours	
Traffic Signal Systems – TTE 6259	3 credit hours
2. Course prerequisites, corequisites, and where the course fits in the program of study	
Prerequisites: None.	
3. Course logistics	
<p>Term: Fall 2014 This is a classroom lecture course with lab. Class location and time: TBD Credit hour assignments: Lectures – 15 weeks, 160 minutes each week; Homework assignments – 12 weeks, about 200 minutes each week; Class project – 12 weeks, 120 minutes each week; Total in-class instruction per credit hour: 1 hour (56 minutes) per week, for 15 weeks Total out-of-class assignments per credit hour: 2 hours and 3 minutes per week, for 15 weeks</p>	
4. Instructor contact information	
<i>Instructor's name</i>	Dr. Aleksandar Stevanovic, Assistant Professor
<i>Office address</i>	Engineering West (EG-36) Bldg., Room 225
<i>Office Hours</i>	M-W 9:00 -11:00 AM
<i>Contact telephone number</i>	561-297-3743
<i>Email address</i>	astevano@fau.edu
5. TA contact information	
<i>TA's name</i>	N/A
<i>Office address</i>	
<i>Office Hours</i>	
<i>Contact telephone number</i>	
<i>Email address</i>	
6. Course description	
<p>The course is designed to teach students about advanced concepts of traffic signal systems which are currently used in the US practice. Students will be able to design, evaluate and optimize various components of traffic signal operations both for individual intersections and coordinated traffic signal systems.</p>	
7. Course objectives/student learning outcomes/program outcomes	
<i>Course objectives</i>	<ul style="list-style-type: none"> I. Introduce basics of traffic signal operations. II. Review operational policies for traffic signals. III. Present traffic signal design concepts. IV. Introduce signal timing parameters and basic signal timing procedures. V. Review requirements for traffic signal coordination. VI. Develop signal timing plans. VII. Present performance measures and operations of traffic signals. VIII. Introduce advanced/adaptive signal timing concepts.
<i>Student learning outcomes</i>	A. Ability to understand and use the various units of measure and basic

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<p>& relationship to ABET a-k student outcomes</p>	<p>traffic flow concepts and kinematic motion equations to analyze movement and position of vehicles in traffic streams (a,b,c,d,e,f).</p> <p>B. Ability to analyze and solve problems involving queuing theory, operations research and other quantitative methods applied in transportation engineering (a,b,d,f,g).</p> <p>C. Ability to understand and apply probability and statistics to analyze, model and solve problems in traffic safety (a,b,c,d,e,f,g)</p> <p>D. Ability to understand and apply trigonometry and geometry to analyze, model and solve problems related to horizontal and vertical design of road facilities (a,b,c,d,e,f).</p> <p>E. Ability to understand, apply and communicate capacity and level of service concepts to design and evaluate traffic roadway facilities (a,b,c,d,e,f,g).</p>	
<p>Relationship to program educational objectives</p>	<p>Outcome 1: Be proficient in the following civil engineering disciplines: (i) structural engineering, (ii) transportation engineering, (iii) geotechnical engineering, (iv) water resources, and (v) environmental engineering.</p> <p>Outcome 2: Have an appreciation for the role of civil engineering in infrastructure planning, protection and sustainability.</p> <p>Outcome 3: Achieve success in finding professional employment and/or pursuing further academic studies.</p>	<p>High</p> <p>Medium</p> <p>Medium</p>
<p>8. Course evaluation method</p>		
<p>Mid Term Exam: 25%</p> <p>Class Project: 25%</p> <p>Final Exam: 25%</p> <p>Homework Assignments: 20%</p> <p>Quizzes/Class participation: 5%</p>	<p><i>Note:</i> The minimum grade required to pass the course is C.</p>	
<p>9. Course grading scale</p>		
<p>There is not any fix criteria for the grading scale. The overall performance, as related to course objectives and outcomes, is evaluated and considered during grading.</p>		
<p>10. Policy on makeup tests, late work, and incompletes</p>		
<p><i>Makeup tests</i> are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student of participating in the exam. Makeup exam should be administered and proctored by department personnel unless there are other pre-approved arrangements.</p> <p><i>Late homework submissions</i> will get (if 100% correct) only 75% of the original points. <i>Late class project submissions</i> are unacceptable.</p> <p><i>Incomplete grades</i> are against the policy of the department. Unless there is solid evidence of medical or otherwise serious emergency situation incomplete grades will not be given.</p> <p><i>Assignments</i> are submitted through Blackboard ONLY and they are always due just before the class starts. Assignments can be written manually and scanned as a pdf file; or they can be developed in word processing programs (or spreadsheets) and converted to pdf files. Each assignment should be submitted as a SINGLE pdf file through Blackboard. Late assignments will be accepted but with a</p>		

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penalty – they will be given only 75% of the earned score. **No assignments will be accepted through any other means (email, in-hand, etc.) except through Blackboard.**

11. Special course requirements

Students are supposed to be familiar with basic statistical concepts. They should also be able to use spreadsheets to perform basic mathematical and statistical computations and report results through charts and tables.

12. Classroom etiquette policy

1. Cell phones and beepers should have the ringers turned off as a courtesy to the instructor and your fellow classmates.
 2. Computers must be closed and turned off in class
 3. You can leave only on breaks
 4. Exams will be given only at the scheduled times and places. No make-ups, except in documented emergencies. No one is exempt from the final examination.
 5. Attendance to class is required. You are expected to attend and participate in all class sessions. Final grades will be reduced by one letter for every three (3) unexcused absences (as determined by the instructor). Attendance to at least one (1) professional meeting is required.
 6. You are expected to complete the assigned reading prior to the date indicated on the class schedule, to do all homework assignments, and to participate fully in the group projects.
 7. Assignments are due at the beginning of class on the date indicated on the assignment sheet.
- University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones and laptops, are to be disabled in class sessions. You are expected to complete the assigned reading prior to the date indicated on the class schedule, to do all homework assignments, and to participate fully in the group projects

13. Disability policy statement

In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca Raton campus, SU 133 (561) 297-3880 and follow all OSD procedures.

14. Honor code policy

Consultation with your classmates on assignments is expected and encouraged; however what you turn in must be your own work. Representing the work of others as your own is unethical and may result in sanctions (see the FAU Policy on Academic Honesty). FAU is committed to a policy of honesty in academic affairs. The instructor's duty is to pursue any reasonable allegation, taking action where appropriate, as described in the appropriate section of the FAU Catalog (<http://www.fau.edu/ug-cat/academic.htm#irregular>) and the Florida Administrative Code. Please be advised that the copying of material from the world wide web or any other written material is considered plagiarism and is also a breach of the Honor Code.

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and place high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. See University Regulation 4.001 at www.fau.edu/regulations/chapter4/4.001_Honor_Code.pdf.

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Regulation 4.001 Code of Academic Integrity

(1) Purpose. Students at Florida Atlantic University are expected to maintain the highest ethical standards. Dishonesty is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility.

(2) Definitions. The FAU Code of Academic Integrity prohibits dishonesty and requires a faculty member, student, or staff member to notify an instructor when there is reason to believe dishonesty has occurred in a course/program requirement. The instructor must pursue any reasonable allegation, taking action where appropriate. Examples of academic dishonesty include, but are not limited to, the following:

(A) Cheating

1. The unauthorized use of notes, books, electronic devices, or other study aids while taking an examination or working on an assignment.
2. Providing unauthorized assistance to or receiving assistance from another student during an examination or while working on an assignment.
3. Having someone take an exam or complete an assignment in one's place.
4. Securing an exam, receiving an unauthorized copy of an exam, or sharing a copy of an exam.

(B) Plagiarism

1. The presentation of words from any other source or another person as one's own without proper quotation and citation.
2. Putting someone else's ideas or facts into your own words (paraphrasing) without proper citation.
3. Turning in someone else's work as one's own, including the buying and selling of term papers or assignments.

(C) Other Forms of Dishonesty

1. Falsifying or inventing information, data, or citations.
2. Failing to comply with examination regulations or failing to obey the instructions of an examination proctor.
3. Submitting the same paper or assignment, or part thereof, in more than one class without the written consent of both instructors.
4. Any other form of academic cheating, plagiarism, or dishonesty.

(3) Procedures.

(A) If the instructor determines that there is sufficient evidence to believe that a student engaged in dishonesty, the instructor will meet with the student at the earliest possible opportunity and provide notice to the student of the instructor's perception of the

facts, the charges against the student, and the sanction. The instructor may not remove the student from the course until the appeal process has come to a conclusion.

(B) If, after this meeting, the instructor continues to believe that the student engaged in dishonesty, the instructor will provide the student written notice of the charges and the penalty. A copy of this statement shall be sent to the chair of the department or director of the school/program administering the course.

(C) The student is entitled to an opportunity to be heard at a meeting with the instructor and chair/director to review and discuss the instructor's charges/statement. Such request for a meeting must be made in writing and received by the chair/director within five (5) business days of receipt of the instructor's charges/statement. The purpose of the meeting is to discuss the facts and to advise the student of the appeal process. The chair/director will provide the student, the instructor, and the dean of

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the college administering the course a summary of both the student's position and the instructor's position.

(D) The student may appeal in writing to the dean of the college administering the course. The appeal must be received by the dean within five (5) business days of receipt of the chair/director's summary from the review meeting. The dean will convene a Faculty-Student Council ("Council"), which will be composed of the dean (or designee), two faculty members, and two students. The dean (or designee) will act as chair of the Council, direct the hearing, and maintain the minutes and all records of the appeal hearing, which will not be transcribed or recorded. The hearing is an educational activity subject to student privacy laws/regulations, and the strict rules of evidence do not apply. The student may choose to be accompanied by a single advisor, but only the student may speak on her/his own behalf. The student and instructor may present testimony and documents on his/her behalf. Additional witnesses may be permitted to speak at the dean's (or designee's) discretion and only if relevant and helpful to the Council. The Council will deliberate and make a recommendation to the dean to affirm or void the instructor's findings of academic dishonesty. The dean (or designee) will inform the student and instructor in writing of his/her findings of academic dishonesty after receipt of the Council's recommendation.

(E) The student may request an appeal in writing of the dean's findings of academic dishonesty to the University Provost (or designee) and include relevant documentation in support of such appeal. The University Provost (or designee) will notify the student, dean, and instructor of his/her decision in writing. This decision by the Provost (or designee) constitutes final University action.

(F) If there is a finding that the Code of Academic Integrity has been violated, the chair will notify the University Registrar that the following notation be included on both the student's official transcript and on the student's internal record: "Violation of Code of Academic Integrity, University Regulations 4.001." If such violation is appealed and overturned, the dean or University Provost (or their designees) will notify the University

Registrar that such notation should be removed from the student's transcript and internal record.

(4) Penalties.

(A) The instructor will determine the penalty to be administered to the student in the course. Penalty grades cannot be removed by drop, withdrawal, or forgiveness policy. Students should be aware that, in some Colleges/programs, failure in a course or a finding of dishonesty may result in other penalties, including expulsion or suspension from the College/program.

(B) In the case of a first offense, the student may elect to complete a peer counseling program administered by the Division of Student Affairs by the end of the semester following the semester in which the dishonesty occurred. Upon successful completion of this program, the notation regarding violation of the Code of Academic Integrity will be expunged from the student's official transcript. The grade, however, will remain unchanged and cannot be removed by drop or forgiveness policy. Also, the notation will remain in internal University student records.

(C) In the case of a repeat offense, even if the notation of violation of the Code of Academic Integrity from the first offense had been expunged from the official transcript as a result of successful completion of the peer counseling program, the student will be expelled from the University.

Specific Authority: Article IX of the Florida Constitution, 1001.706, 1001.74 F.S., Board of Governors Regulations 1.001, 6.010, and 6.0105. History—New 10-1-75, Amended 12-17-78, 3-28-84, Formerly 6C5-4.01, Amended 11-11-87. Formerly 6C5-4.001. Amended 5-26-10

See University Regulation 4.001 at www.fau.edu/regulations/chapter4/4.001_Honor_Code.pdf.

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15. Required texts/reading	
1. There is no single textbook that can be used to present all of the material in this course. Therefore the instructor will use a variety of reading material, assembled from pertinent journal and periodical papers along with publications from FHWA, U.S. Department of Transportation, and other sources.	
16. Supplementary/recommended readings	
1) Traffic Signal Timing Manual, Federal Highway Administration, 2008, 274 pages. [http://ops.fhwa.dot.gov/publications/fhwahop08024/fhwa_hop_08_024.pdf]	
17. Course topical outline, including dates for exams/quizzes, papers, completion of reading	
Lectures	
<i>Date</i>	<i>Topic</i>
Week 1	Introduction to Traffic Signal Systems
Week 2	Queuing Theory and Traffic Signals
Week 3	Traffic Flow Theory and Traffic Signals
Week 4	Mathematical Methods for Optimal Signal Control
Week 5	HCM Methodology for Traffic Signals
Week 6	Traffic Detection Technologies for Traffic Signals
Week 7	Signal Timing Policies
Week 8	Operational and Safety Analysis of Traffic Signals
Week 9	Mid-term Exam
Week 10	Traffic Signal Design Concepts
Week 11	Basic Signal Timing Procedure
Week 12	Signal Controller Parameters and Logics
Week 13	Coordination of Traffic Signals – Requirements and Methods
Week 14	Signal Timing (Optimization) Process
Week 15	Performance Measures and Monitoring of Traffic Signals
Week 16	Advanced Signal Timing Concepts
Final Week	Final Exam