

**University of Florida**  
**Department of Civil and Coastal Engineering**

**TTE 6205 – FREEWAY OPERATIONS AND  
SIMULATION**

**Course Description:** This course addresses the area of freeway operations analysis and simulation. Topics covered include: uninterrupted traffic flow theory; analysis with Highway Capacity Manual methods; microscopic simulation, and freeway management and control methods. This is a 3-credit course.

**Pre-requisite:** Permission of Instructor

**Background and Course Objectives:** Freeway facilities are intended to offer the highest level of mobility of any component within the roadway network. Freeways are also generally responsible for moving the largest volume of traffic in the network. Given the vital purpose that these roadway facilities serve, it is essential for the traffic engineer to be able to properly analyze these facilities, under a variety of traffic demand, geometric, and management/control configurations.

This course has five primary learning objectives. In this course, the student is expected to...

1. learn the fundamental principles underlying traffic flow on freeway facilities
2. learn how to analyze the operational impacts of freeway traffic flow with the analytical methods of the Highway Capacity Manual (HCM)
3. learn how to apply a simulation tool to the analysis of freeway operations
4. develop an understanding of the limitations of both the HCM analysis methods and of microsimulation
5. develop an understanding of the differences in results generated by the HCM analysis methods and simulation for situations in which both can be applied for the analysis.

**Instructor:** Dr. Scott Washburn  
Department of Civil and Coastal Engineering  
580-A Weil Hall  
Email: [swash@ce.ufl.edu](mailto:swash@ce.ufl.edu)  
Web site: <https://swash.essie.ufl.edu/>  
Office Hours: Wed 9:30–11:00 AM, Thur 10:30 AM – 12:00 PM; or by appointment

**Course Website:** <http://elearning.ufl.edu/>

**Meeting Location and Times:** CSE E122; Tuesday Periods 2-3 (8:30 AM - 10:25 AM),  
Thursday, Period 3 (9:35 AM - 10:25 AM)

**Student Material:** Several reference materials will be utilized in this course, all of which will be made available to you in one form or another.

## Topics Covered:

- Uninterrupted flow fundamentals
- Field data measurements
- HCM freeway analysis methodologies
  - Basic segments
  - Merge/diverge segments
  - Weaving segments
  - Facility (undersaturated and oversaturated)
  - Managed Lanes
  - Travel time reliability
- Ramp Metering
- Simulation

**Course Requirements:** There will be several extensive assignments/projects during the semester, focusing on a combination of topics/concepts.

**Class Attendance:** There is no specific attendance policy; however, students are responsible for learning the content of each class session, which may or may not be contained in the reference material(s). Thus, you are strongly encouraged to attend all class meetings.

**Class Demeanor and Etiquette:** This should follow the rules of common sense. Students are encouraged to participate in class discussion and to initiate such discussion whenever they feel that they or the class could benefit from a dialog with the instructor. Other actions that disturb the class are *strongly* discouraged. Use of a laptop for class-related activities is acceptable, but not for non-class activities (e.g., engaging in chat room discussions, E-mail, or surfing the web). ***Cell phones and pagers should be turned off or muted*** (if you need it for potential emergency notification, please see me before class to discuss). There is no official dress code for this class, but please dress appropriately. Again, use common sense--if it is something you typically wear in the bedroom, or on the beach, please do not wear it to class.

**Grading:** Grades will be given at the end of the semester based only on the work completed during the semester. Only assignments received by the due date (5:00 PM) will be eligible to receive full credit. Assignments will be accepted up until one week late, but will only be eligible to receive up to 75% of the original maximum. No credit will be given for assignments turned in after that period.

### *Grading Scale:*

<b>Total Percentage of Available Points</b>	<b>Final Grade</b>
94+ %	A
90-94 %	A-
86-90 %	B+
82-86 %	B
78-82 %	B-
74-78 %	C+
70-74 %	C
66-70 %	C-
62-66 %	D+
58-62 %	D
54-58 %	D-
< 54 %	E

“Graduate students need an overall GPA of 3.00 truncated and a 3.00 truncated GPA in their major (and in the minor, if a minor is declared) at graduation.” For more information on grades and grading policies, please visit:

<http://gradcatalog.ufl.edu/content.php?catoid=4&navoid=907#grades>

**Class Policy on Student Collaboration:** It is acceptable to work with other classmates, and even recommended, to assist your learning of the material required to complete the assignments. It is NOT acceptable to copy another person’s or group’s assignment solution(s). Every student (or team in the case of team assignments) is responsible for turning in an individual assignment that represents their own work.

## **University/Class Policies**

**Honesty Policy:** UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor.

**Students Requiring Accommodations:** Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

### **Student Privacy**

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see:

<http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html>

**Software Use:** All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

**Course Evaluation:** Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

## Campus Resources:

### Health and Wellness

**U Matter, We Care:** If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575 or visit [umatter.ufl.edu](http://umatter.ufl.edu) to refer or report a concern and a team member will reach out to the student in distress.

**Counseling and Wellness Center:** Visit [counseling.ufl.edu/](http://counseling.ufl.edu/) or call 352-392-1575 for information on crisis services as well as non-crisis services.

**Student Health Care Center:** Call 352-392-1161 for 24/7 information to help you find the care you need, or visit [shcc.ufl.edu](http://shcc.ufl.edu).

**University Police Department:** Visit [police.ufl.edu](http://police.ufl.edu) or call 352-392-1111 (or 9-1-1 for emergencies).

**UF Health Shands Emergency Room / Trauma Center:** For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; [ufhealth.org/emergency-room-trauma-center](http://ufhealth.org/emergency-room-trauma-center).

### Academic Resources

**E-learning technical support:** Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).

**Career Connections Center:** Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services [career.ufl.edu/](http://career.ufl.edu/).

**Library Support:** [cms.uflib.ufl.edu/ask](http://cms.uflib.ufl.edu/ask) various ways to receive assistance with respect to using the libraries or finding resources.

**Teaching Center:** Broward Hall, 352-392-2010 or to make an appointment 352-392-6420. General study skills and tutoring. [teachingcenter.ufl.edu](http://teachingcenter.ufl.edu)

**Writing Studio:** 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers. [writing.ufl.edu/writing-studio](http://writing.ufl.edu/writing-studio)

**Student Complaints On-Campus:** [sccr.dso.ufl.edu/policies/student-honor-code/student-conduct-code](http://sccr.dso.ufl.edu/policies/student-honor-code/student-conduct-code)

**On-Line Students Complaints:** [distance.ufl.edu/student-complaint-process](http://distance.ufl.edu/student-complaint-process)