

# NEW COURSE PROPOSAL

**GRADUATE** Level I (Masters & Phd courses) \_\_\_\_\_ Level II (Phd courses) \_\_\_\_\_

**UNDERGRADUATE**   X  

**SCHOOL, DEPARTMENT, COLLEGE:** \_\_\_\_\_ CEE

**DATE:** 8/21/17

1. Proposed Subject Code & Course Number: (Verify with Registrar's Office) CEE 4660	2. Hours: LECTURE <u>  2  </u> LAB/RECITATION <u>  1  </u> SEMESTER CREDIT <u>  3  </u> Is this course repeatable for credit? <u>  NO  </u>																		
3. Descriptive Title: Sustainable Transportation Abroad																			
4. Recommended Abbreviation for Transcript – (24 characters including spaces): <div style="border: 1px dashed black; padding: 5px; text-align: center; font-family: monospace; font-size: 1.2em;">           S U S T A I N     T R A N S P O R T     A B R O A D         </div>																			
5. Catalog Description – (25 words or fewer)  Planning, design, and operations of transportation systems in countries with sustainable multimodal infrastructure; applying lessons learned to US; leadership development in context of sustainable technologies																			
6. Preferred Grade Basis: <u>  L/G  </u> P/F Audit  (Note: The default is all grade modes allowed. If this is not preferred for this course, please explain why that is the case.)																			
7. Prerequisites: (For graduate level courses, Graduate Standing or Permission of Instructor is assumed) Junior or Senior standing, and with permission of the instructor  Prerequisites with concurrency: CEE 3000 (Civil Engineering Systems) or ISYE 3025 (Engineering Economics) Corequisites:																			
8. Has the course been taught as a special topic? If <b>YES</b> , When <u>  Summer 2016 , Summer 2017  </u> Enrollment: <u>  7, 8  </u>																			
9. Is this course equivalent to another course (graduate or undergraduate) taught at Ga. Tech? If yes, list course number(s): <u>  NO  </u>																			
10. For undergraduate courses, are you requesting that this course satisfy: Humanities _____ Social Science _____ Ethics _____ Global Perspective <u>  X  </u>																			
11. Expected Mode of Presentation:	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">MODE</th> <th style="width: 40%;">% of COURSE</th> </tr> </thead> <tbody> <tr> <td rowspan="5"> <ul style="list-style-type: none"> <li>Lecture</li> </ul> </td> <td>Lecture</td> <td>20</td> </tr> <tr> <td>Discussion</td> <td>20</td> </tr> <tr> <td>Seminar</td> <td>20</td> </tr> <tr> <td>Demonstration</td> <td></td> </tr> <tr> <td>Other (Specify) Presentations, Site Visits</td> <td>40</td> </tr> <tr> <td rowspan="2"> <ul style="list-style-type: none"> <li>Lab/Recitation</li> </ul> </td> <td>Supervised</td> <td>100</td> </tr> <tr> <td>Unsupervised</td> <td></td> </tr> </tbody> </table>	MODE	% of COURSE	<ul style="list-style-type: none"> <li>Lecture</li> </ul>	Lecture	20	Discussion	20	Seminar	20	Demonstration		Other (Specify) Presentations, Site Visits	40	<ul style="list-style-type: none"> <li>Lab/Recitation</li> </ul>	Supervised	100	Unsupervised	
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13. Probable Instructor(s) – <i>Please mark with an asterisk any non-tenure track individuals.</i> Kari Watkins, Adjo Amekudzi-Kennedy																			
14. Purpose of Course: Relation to other courses, programs and curricula: To serve as a study abroad course in the Minor in Leadership Studies--Global Engineering Track																			
15. Required _____ Elective <u>  X  </u>																			
16. Submit a course syllabus See attached																			
17. Can the class count toward degree requirements at Georgia Tech? <u>  YES  </u>																			
18. Is this class restricted to Free Elective only? <u>  NO  </u>																			

**CEE 4660**  
**Sustainable Transportation Abroad**  
**Spring 2018**

Instructor: Dr. Kari Watkins, [kari.watkins@ce.gatech.edu](mailto:kari.watkins@ce.gatech.edu), 206-250-4415

TAs: Dave Ederer, [davidederer@gatech.edu](mailto:davidederer@gatech.edu), 716-348-9944  
Second depending on number registered

Official Description: In this course, we will focus on the planning, design, and operations of transportation systems in countries abroad that are known for a sustainable multimodal approach to transportation. This course is a study abroad course tied to the Global Engineering Leadership Minor administered in Civil and Environmental Engineering. The leadership competencies this course will focus on include cultural awareness / global competency, informal mentoring, and feedback.

The initial offering will focus on the Netherlands, a country where substantial efforts have been made to encourage cycling and transit usage by residents of all ages and cycling levels of comfort. The Dutch consider cycling more sustainable because of the reduction in space required, low emissions and noise, and health impacts. Dutch infrastructure provides good examples of protected bicycle infrastructure, traffic calming, transit network design, and transit and bicycle integration.

Objectives: This course has four primary objectives:

1. Assess differences in transportation infrastructure planning and design between the US and abroad based on experiences with sustainable transportation abroad
2. Design a transportation corridor in the US using design guidance and observations from abroad
3. Explain and critique multiple perspectives on transportation planning, design, and operations using written, oral, and visual aid communication based on observations and interactions with their peers and with two mid-career transportation professionals who will attend the study abroad program with the students
4. Learn how to effectively establish a mentor relationship and give feedback in professional situations

Prerequisites: CEE 3000 (Civil Engineering Systems) or ISYE 3025 (Engineering Economics)

Format: This course will include several initial meetings and a site visit of Atlanta prior to spring break to discuss preparations. The course will include 8 days biking and riding trains in the Netherlands with site visits. The lectures and assignments will focus on bicycle and transit design differences between the US and the Netherlands. Site visits will reinforce concepts by assessing these differences in the field. Students will use time upon return to Atlanta to conduct design work in pairs, present that design work, and assess and comment on each other's designs.

Academic Honesty: Although your final design will be your own, collaboration in this course is highly encouraged. However, all uses of materials that are not your own must be sourced appropriately. Plagiarizing is defined by Webster's as "to steal and pass off (the ideas or words of another) as one's own: use (another's production) without crediting the source." If caught plagiarizing, you will be dealt with according to the GT Academic Honor Code. For any questions involving these or any other Academic Honor Code issues, please consult the instructor or [www.honor.gatech.edu](http://www.honor.gatech.edu).

Acknowledgments: Much of the content and logistics of this course were taken from courses offered by Dr. Peter Furth and Jeff Rosenblum at Northeastern University, Peter Koonce of the City of Portland, and Dr. Robert Bertini of University of South Florida. The instructor is tremendously indebted to them.

Physical requirements: You must be able to ride a bicycle and be in decent physical shape to take this course. Each site visit will include 10 – 20 miles of bike riding and site visits will take place many days in a row. The pace will be leisurely, but the miles will add up over multiple days. To request disability accommodations for this course, please contact the Office of Disability Services (<http://disabilityservices.gatech.edu/>) and they will work with you and the instructor.

Assessment: Grading will take place as follows:

- 20% Discussion Participation – Students must be active participants in course discussion before and during the trip. Students should complete all readings; attend all lectures, discussions, and site visits; and actively ask and answer questions either in a large group or individually with the guest speakers, instructor, and TAs. In particular due to the time zone difference, students must ensure they are getting sleep to be prepared to actively participate in lectures. Students will receive input regarding their grade and points about improvement midway through the course.
- 20% Blogs – Students will be expected to maintain a blog with at least 8 reflective posts and photos, taking place prior to, throughout, and after the trip. These will include evaluation of how Dutch culture influences design and vice versa, how designs differ from what is found in the US, and the impacts of these differences on the transportation network.
- 20% Design and Leadership Assignments – Three facilities design assignments will be given throughout the course to assess understanding of design principles. One assignment related to mentoring will be completed throughout the course for students to reflect on their mentoring experience on the trip, plans for obtaining mentors in their early career, and goals for how they could serve as mentors to younger students.
- 40% Projects – Students will conduct a final project taking a corridor in Atlanta and applying a Dutch design approach. Students will provide constructive feedback to one another on the designs.

References: Readings in this course fall into two categories, those pertaining to sustainable transportation infrastructure planning and design and those pertaining to leadership. Readings regarding bicycle infrastructure that are to be completed in advance, include:

- Pucher, J. and R. Buehler (2012), “City Cycling” (Required chapters 1, 2, 6, 8, 13 and another of choosing)
- Dutch Ministry of Transport, Public Works and Water Management (2009) “Cycling in the Netherlands”.  
<http://www.fietsberaad.nl/library/repository/bestanden/CyclingintheNetherlands2009.pdf>
- Dutch Ministry of Infrastructure and the Environment (2013), “Summary National Policy Strategy for Infrastructure and Spatial Planning”.  
<https://www.government.nl/documents/publications/2013/07/24/summary-national-policy-strategy-for-infrastructure-and-spatial-planning>

Readings regarding leadership clarify how to find and work with a mentor, leadership traits, and how to provide feedback in professional situations. Readings that are to be completed in advance, include:

- University of Washington, “Mentoring: A Guide for Students”, <http://grad.uw.edu/for-students-and-post-docs/core-programs/mentoring/mentoring-guides-for-students/>
- “Feedback is a Gift”, <http://www.gsb.stanford.edu/insights/carole-robin-feedback-gift>
- “The Indispensable Traits of a Collaborative Leader”  
<http://qaspire.com/2014/05/11/indispensable-traits-of-a-collaborative-leader-part-3/>
- Meyer, E. (2015) “Giving Negative Feedback Across Cultures”  
<http://knowledge.insead.edu/blog/insead-blog/giving-negative-feedback-across-cultures-4259>

In addition to the readings, Mark Wagenbuur (YouTube handle = Markenleij; web page [bicycledutch.wordpress.com](http://bicycledutch.wordpress.com)) maintains an excellent video series about bicycling in the Netherlands. You should watch at least 6 of his videos prior to departure, including:

- Cycling in the U.S. from a Dutch perspective, [https://youtu.be/m2THe\\_10dYs](https://youtu.be/m2THe_10dYs)
- How the Dutch got their cycle paths, <https://www.youtube.com/watch?v=XuBdf9jYj7o>
- Cycling Amsterdamsestraatweg, Utrecht, <https://www.youtube.com/watch?v=FOkbz4tm324>
- Bicycle Rush Hour, Utrecht III, <https://www.youtube.com/watch?v=n-AbPav5E5M>
- Two more of your choice

Finally, the following design manuals do not have to be read in their entirety, but should serve as references. Copies will be available in the Netherlands and in Atlanta for student projects:

- Crow (2007), “Design Manual for Bicycle Traffic” (Dutch manual translated to English)
- USDOT (2009), “Manual on Uniform Traffic Control Devices”, <http://mutcd.fhwa.dot.gov/>
- AASHTO (2012), “Guide for the Development of Bicycle Facilities, 4<sup>th</sup> Edition”
- NACTO (2012), “Urban Bikeway Design Guide”, <http://nacto.org/cities-for-cycling/design-guide/>
- AASHTO (2011), “A Policy on the Geometric Design of Highways and Streets”, 6<sup>th</sup> Edition

Date	Activities	Assignments Due
<b>Pre-trip</b>		
Fri, Jan 12	No Class	
Fri, Jan 19	<u>Lecture</u> : Trip logistics	
Fri, Jan 26	<u>Lecture</u> : Transportation in the Netherlands	Create blog Blog post #1 – introduce self, background, goals for course
Fri, Feb 2	<u>Site Visit</u> : Bike & transit tour of Atlanta (4 hrs lab)	Blog post #2 – reaction to Wagenbuur videos, including cultural perspective
Fri, Feb 9	<u>Discussion</u> : Project ideas and corridors	Design assignment #1
Fri, Feb 16	<u>Lecture</u> : Giving Feedback (Dr. Wes Wynens)	Blog post #3 – pre-trip readings (Leadership)
Fri, Feb 23	<u>Lecture</u> : Pre-trip readings, mentoring	Blog post #4 – pre-trip readings (City Cycling, Cycling in the Netherlands)
Fri, Mar 2	<u>Lecture</u> : Design for Bicycles	Design assignment #2
Fri, Mar 9	<u>Lecture</u> : Cultural awareness	
<b>Trip</b>		
Fri, Mar 16	Fly Atlanta to Amsterdam	
Sat, Mar 17	Train to Delft, get settled in rooms, get bikes	
Sun, Mar 18	Cultural Outing: Bike to Rotterdam, Water Bus to World Heritage Site Kinderdijk	
Mon, Mar 19	<u>Site Visit 1</u> : Delft Facilities Tour (6 hrs lab) <u>Site Visit 2</u> : Train Station Tour (2 hrs lab)	Blog post #5 – initial assessment of design and cultural perspectives

Tues, Mar 20	<u>Lecture</u> : Sustainable Transport in the Suburbs (2 hrs lec) <u>Site Visit</u> : Ypenburgh – Leidscheveen (6 hrs lab)	Design assignment #3
Wed, Mar 21	<u>Site Visit</u> : Transit tour (4 hrs lab) <u>Lecture</u> : High quality public transportation (2 hrs lec) <u>Discussion</u> : Public transportation (2 hrs lab)	Blog post #6 – Transit-bike integration, reliable public transportation in the Netherlands
Thurs, Mar 22	<u>Lecture</u> : Biking and Walking in the Hauge (2 hrs lec) <u>Site Visit</u> : Walk Tour (2 hrs lab) <u>Site Visit</u> : Bike Tour (2 hrs lab)	
Fri, Mar 23	<u>Lecture</u> : Sustainable Network Design (2 hrs lec) <u>Site Visit</u> : Houten (6 hrs lab)	Blog post #7 –Houten
Sat, Mar 24	<u>Site Visit &amp; Cultural Outing</u> : Amsterdam including Sustainable Amsterdam tour (4 hrs lab plus)	
Sun, Mar 25	Check out and return to US	
<b>Post-Trip</b>		
Fri, Mar 30	<u>Discussion</u> : Comparing US and Dutch infrastructure, projects	Mentoring assignment Blog post #8 – Final thoughts (infrastructure design and cultural perspective)
Fri, Apr 6	<u>Discussion</u> : Designing US infrastructure in the Dutch model, projects	
Fri, Apr 13	<u>Discussion</u> : Tying it all together, projects	
Fri, Apr 20	<u>Final Design Presentations</u>	Final Design Report due Feedback assignment

### Final Design Project:

Upon completion of the study abroad portion of the course, students will conduct a final project using lessons learned from the study site visits, discussions and readings. Students have one of three possible options:

1. The student will identify a one mile roadway corridor in Atlanta that could benefit from a Dutch cycling design approach. The student will develop a conceptual design for the roadway and provide recommendations on how to improve transportation movements for cyclists. As part of the project, the student should assess the current functionality of the roadway in terms of all modes and the likely impact from the design changes. The conceptual design will include the entire length of roadway (all intersections and driveways) and be presented on aerials or base mapping as available.
2. The student will identify a critical point in Atlanta (major destination like MARTA station, Ponce City Market, Braves Stadium, etc) and assess the low stress bicycle network connectivity within a 3 mile radius. The student will identify key improvements that could be made to increase the network connectivity and assess the increase.
3. The student will identify a transit station in Atlanta and assess the station accessibility for bikes and pedestrians. Station accessibility includes adjacent access (1/4 mi), parking, wayfinding signage, repair stations, etc. The student will identify key improvements that could be made to improve the station area accessibility for bikes and pedestrians.

Additional project topics can be suggested by the student, but must be approved by the instructor. Projects will be conducted in pairs. Project selection and measurement must take place prior to departure and students must strategically pair with another student or be prepared to work alone.

Copies of the following design guides will be available for projects:

- Crow (2007), "Design Manual for Bicycle Traffic" (Dutch manual translated to English)
- USDOT (2009), "Manual on Uniform Traffic Control Devices", <http://mutcd.fhwa.dot.gov/>
- AASHTO (2012), "Guide for the Development of Bicycle Facilities, 4<sup>th</sup> Edition"
- AASHTO (2011), "A Policy on the Geometric Design of Highways and Streets", 6<sup>th</sup> Edition
- NACTO (2012), "Urban Bikeway Design Guide", <http://nacto.org/cities-for-cycling/design-guide/>

### Design Project Feedback:

Projects will be presented in person on April 20. Several Dutch professionals and professors we met during our trip abroad will be asked to join the presentations via skype and the professionals who attend the course will be invited to be present. Each student pair will give a 15 minute presentation of their design. Following each presentation, students will spend 15 minutes providing constructive feedback to one another on the designs through the feedback process discussed in class.

### Blogs:

Students are expected to maintain a blog within the course blog, posting at least 8 times using the themes below. Posting more than 8 times is certainly acceptable and students are encouraged to post about all interesting elements of their trip. Each blog post should be at least two paragraphs and should include applicable photos taken during site visits with maps to designate locations as applicable.

1. Introduce yourself. Where are you from and what is the transportation system like in your hometown? Where have you traveled and how did that influence your thinking about transportation? What are your goals for this course?
2. *Part 1* - How comfortable do bike facilities in Atlanta make you feel about biking? Answer questions on the blog. *Part 2* - Watch 6 Mark Wagenbuur videos about bicycling in the Netherlands (including 4 in the references list). How do the designs differ from intersections in the US? How is cycling perceived in the Netherlands?
3. Read the pre-trip materials regarding leadership and summarize the importance of mentoring, how to find and work with a mentor, leadership traits, and how to provide feedback in professional situations.
4. Read the pre-trip materials regarding design and write about your reaction. How is transportation design and planning different in the Netherlands? What is the impact of those differences?
  - Pucher and Buehler's "City Cycling"
  - Dutch Ministry's "Cycling in the Netherlands"
  - Dutch Ministry's "Summary National Policy Strategy for Infrastructure and Spatial Planning"
5. After your first two days abroad, what is your initial assessment of cycling in the Netherlands? How does the design differ from the US? How are cyclists prioritized? How is cycling perceived in their culture?
6. How do the Dutch integrate transit & bikes? How easy is it to park your bike & board a train? What design elements influence the transition? Can bikes be brought on board? How do the Dutch measure transit performance? How have they made transit reliable and responsive?
7. How has Houten approached design of their transportation network? Can you imagine such an approach in the US? Why or why not?
8. What are your final thoughts about Dutch infrastructure design reflecting on two weeks spent abroad? How does design differ from the US? How has their culture influenced this design and how has the design influenced their culture?