

**SPECIAL REPORT**  
**OF THE**  
**PROGRAM AND BUDGET**  
**AND GRADUATE COUNCILS**

concerning

**CREATION OF A DUAL MASTER'S PROGRAM:  
MASTER OF REGIONAL PLANNING/  
MASTER OF SCIENCE IN CIVIL ENGINEERING  
(TRANSPORTATION GROUP)  
(#5254)**

Presented at the  
782<sup>nd</sup> Regular Meeting of the Faculty Senate  
December 6, 2019

**COUNCIL MEMBERSHIP**

**PROGRAM AND BUDGET COUNCIL**

Joseph Bartolomeo, William Brown, D. Anthony Butterfield, Elizabeth Chang, Tanushree Chatterjee, Nancy Cohen, Patricia Galvis y Assmus, Steven Goodwin, Deborah Gould, Mark Guerber, Eddie Hull, Moira Inghilleri, Michael Leto, Andrew Mangels, Ernest May, Lynn McKenna, Moksha Padmaraju, Anthony Paik, *Chair*, MJ Peterson, Alex Phillips, Anurag Sharma, Catrine Tudor-Locke, Lisa Wegiel

**GRADUATE COUNCIL**

Nadia Al-Ahmed, Sonia Alvarez, Joseph Black, Justin Burch, D. Anthony Butterfield, Ana Caicedo, Canan Çevik, David Cort, Robert DeConto, Jennifer Friedman, Mark Hamin, Laura Hancock, Neil Immerman, Cynthia Jacelon, Ramakrishna Janaswamy, Barbara Krauthamer, John Lopes, David Morin, Martina Nieswandt, Sarah Pfatteicher, Sarah Poissant, Rebecca Reznik-Zellen, Frederic Schaffer, Patrick Sullivan, Bianki Torres, David Vaillancort, Tilman Wolf, Kristine Yu

**PROGRAM AND BUDGET COUNCIL**

The Program and Budget Council unanimously approved of this proposal.

**GRADUATE COUNCIL**

The Graduate Council recommends approval of this proposal.

*Provide a Curriculum Outline of Core Courses and Elective Courses for Each of the Separate Degrees.*

See attached.

**Core Requirements**

*Describe of how core requirements from each program will be met, with no fewer than 30 credits coming from each program and a credit savings of no more than 20% between the programs.*

Please see proposal; MRP credits reduced from 48 to 36 (as with other MRP dual degrees); MS CEE credits reduced from 31 to 30; overall credit reduction well below 20%.

**Thesis**

*If a thesis is required in either program, the dual master's option must require a thesis. Do either or both programs require a thesis?*

No.

**Comments:**

MRP Program allows Thesis, Project, or Three-Course Option; MS CEE Program allows Thesis or Course Option.

**Cooperating Departments**

*Provide arguments from cooperating departments which discuss the need and inherent value of combined programs.*

Please see proposal; students in each of the programs already take courses in the other program on a regular basis; land-use/infrastructure planning and transportation engineering are highly complementary professional fields.

**MOTION:** That the Faculty Senate approve the Creation of a Dual Master's Program:  
**10-19** Master of Regional Planning/Master of Science in Civil Engineering  
(Transportation Group), as presented in Sen. Doc. No. 19-032.

## Proposal for Dual Degree Program

### Master of Regional Planning (MRP) / Master of Science in Civil Engineering (MS CE, Transportation)

The Landscape Architecture and Regional Planning Department's Master of Regional Planning Program and the Civil and Environmental Engineering Department's Master of Science Program propose to offer a dual degree program for students to earn the Master of Science in CE (in the Transportation Program) and the Master of Regional Planning in two years plus summers of full-time study. The professions of planning and civil engineering are intertwined in numerous ways. Many positions in government as well as in the private and nonprofit sectors can best be filled by people who have the technical knowledge and skills of systems engineers, analysts and planners. For example, transportation planners in local governments may often work with civil engineers within government agencies and organizations. Conversely, transportation engineers, especially in rapidly growing enterprises or organizations, may be hampered if they lack skills to formulate and implement plans in a municipal or regional context. This connection is reflected in the fact that there is already a high degree of crossover between MS CE transportation students taking MRP courses as well as MRP students taking MS CE transportation courses. Our prospective students have likewise expressed a great deal of interest in this potential combination.

This dual-degree program would be one of only a handful in the nation. It permits the mastery of core knowledge and skills in both areas in two years (plus summers) or less, instead of the three years or more that would otherwise be required. It does so by eliminating duplicative coursework in research methods and concentration electives. Students will spend two semesters of full-time study in each program, and then distribute remaining coursework between the two programs.

The MS CE core curriculum is designed to provide students with strong technical foundations, applicable to a wide range of system engineering projects. The MRP core curriculum focuses on combining theoretical, historical, social, political, and technical dimensions of planning practice with strong emphasis on practice through studio and service to area communities. The two+ year dual-degree program would offer students an educational experience in many areas of science, project management and planning, including infrastructure development, systems analysis and implementation, resource policy and planning, information technology, and sustainability tools and techniques, related to transportation as it pertains to land use and economic development.

The MRP/MS CE degree program will provide its graduates with comprehensive education for professional careers in transportation engineering and planning, systems analysis, public policy, project management, and infrastructure development careers at the national, state and local level. Students must apply to and be admitted to both programs, and must meet satisfactory academic progress requirements in each program. Before admission, students will be required to complete courses in calculus, statistics, and physics (or equivalent practical experience).

**Please Note: While the Department is Civil and Environmental Engineering, the MS degree is in Civil Engineering. This proposal is comparable to and based on MRP dual-degree programs already created and approved by the Faculty Senate, e.g., MRP/MPPA, MRP/MS Sustainability Science, etc. No additional resources will be required to support this dual-degree program.**

**Table 1: Outline for Master’s Students in Regional Planning and Transportation Engineering (48 + 31 = 79 total credits for the programs completed separately = 3 years of study)**

<p><b>Existing MRP Program (LARP)</b>  <b>7 required Core Courses (3 credits unless specified):</b></p> <p>620 Quantitative Methods in Planning          625 Introduction to Geographic Information Systems          630 The Practice of Public Participation          635 Research Issues in Landscape Architecture and Regional Planning          651 Planning History and Theory          656 Planning Law          675 Regional Planning Studio (6 credits)</p> <p>Either:          698 Master's Project (6 credits), or          699 Master's Thesis (8-9 credits), or          3 Course Option (9 credits)</p> <p><i>Total Core Credits: 30 (Project) or 33(Thesis/3 course)</i></p> <p><b>Concentrations: 3 Required Courses (3 credits each)</b>          Students must take two required classes within each concentration and one outside elective relevant to the concentration</p> <p><b>A. Land Use and Environmental</b>  <b>B. Community and Equity</b>  <b>C. Economic Development</b>  <b>D. Independently-Designed Concentration</b></p> <p><i>Total Concentration Credits: 9</i></p> <p><b>General Electives:</b>          Can be taken in a different RP concentration or outside of the department</p> <p><i>Elective Credits: 6 to 9 (Project or Thesis)</i></p> <p><b>TOTAL CREDITS: 48</b></p>	<p><b>Existing MS Program (CE)</b>  <b>3 Required Core Courses (3 credits unless specified):</b></p> <p>CEE 509 Transportation System Analysis          CEE 511 Traffic Engineering          CEE 516 Transportation Design          CEE 695A Transportation Seminar (1 credit)</p> <p><i>Total Core Credits: 10 credits</i></p> <p><b>Concentration and Elective Courses: 2 required (3 credits each) and Project, Thesis or Course Option (6 credits)</b></p> <p>CEE 600-level Transportation Engineering Electives, not including project or thesis credits (6 credits)</p> <p>Either          CEE 698 Graduate Project (6 credits), or          CEE 699 Graduate Thesis (6 credits), or          CEE 6XX Course Option (6 credits)</p> <p><i>Total Concentration Credits: 12 credits</i></p> <p><b>General Electives (9 credits):</b>          500 or 600 level courses in a related topic from any department (conditional on advisor’s approval)</p> <p><i>Elective Credits: 9 credits</i></p> <p><b>TOTAL CREDITS: 31</b></p>
--	---

## Proposed Dual Degree MRP/MS CE (Transportation)

The proposed dual degree will take advantage of the already existing synergies between the two separate programs, economizing on concentration curriculum with overlapping subject matter, while using the flexibility inherent in elective credits to complete all core requirements for both programs while also achieving a savings in overall credits.

Dual degree candidates will be required to fulfill the coursework equivalent of at least 36 credit hours in the MRP program and at least 30 credit hours in the MS CE program, 66 credits total. Students will be required to complete the entire core curriculum of each program. MS CE core and program courses will be considered as an equivalent substitute for the 9 concentration credits required by the MRP program. Likewise, MRP core and program courses would be accepted as fulfilling MS CE general electives.

Students will also fulfill the joint requirements for MS CE Thesis, Project, or 2-course option and MRP Thesis, Project, or 3-Course Option on a topic of relevance to both programs. The options for students are as follows:

Option	MRP	MS CE	Total Credits
A	MRP Project (6 credits) or Thesis (8-9 credits)	600-level Course Option (6 credits)	12 – 15 credits
B	Course Option (9 credits)	CEE Project or Thesis (6 credits)	15 credits
C	Course Option (9 credits)	600-level Course Option (6 credits)	15 credits
D	MRP Project (6 credits) or Thesis (8-9 credits)	CEE Project or Thesis (6 credits)	12 – 15 credits

The remainder of the minimum dual MRP/MS CE program requirement of 66 total credit hours will be filled through electives. Depending the project/thesis/course-option selected, this would be 6-9 credits of elective MRP courses, which may be filled by any MRP concentration course, including concentration electives that, while related to planning, may often be offered in other graduate departments (especially Civil and Environmental Engineering). The remaining 15 CE elective courses will include at least 6 credits of CE 600-level courses and 9 credits of elective CE courses, which may be filled by relevant electives in CE or other departments.

The proposed MRP/MS CE program complies with the university requirements for dual-degree programs and is modeled after similar and already-approved LARP programs (e.g., MLA/MRP, MRP/March, MRP/MPPA, MRP/MS3). It requires more than the minimum threshold of 60 total credits (66); it requires at least 30 credits for each program (36 + 30); it requires students to take all the core requirements for each program, and so still complies with professional accreditation requirements; and there is no more than a 20-25% credit savings per program (66 total credits for the dual degree rather than 79 credits total separately, a savings of 13 credits, or 16%), which will allow students to take electives beyond core requirements.

**Table 2: Dual Degree Option – Proposed Plan**

MRP Program			MS CE Program		
#	Description	Credits	#	Description	Credits
<i>Core Courses (3 credits unless specified):</i>					
651	Planning History and Theory	3	509	Transportation System Analysis	3
656	Planning Law	3	511	Traffic Engineering	3
620	Quantitative Methods	3	516	Transportation Design	3
625	Introduction to Geographic Information Systems	3			
630	The Practice of Public Participation	3			
635	Research Issues in Landscape Arch. & Regional Planning	3			
675	Regional Planning Studio	6			
MRP concentration courses (covered by MS CE courses)			Program Electives		
			Two CEE 600-level electives		6
<i>Combined MRP &amp; MS CE Thesis/Project (Select one of A, B, C or D)</i>					
A	698 Master's Project, or 699 Master's Thesis	6 9	Two CEE 600-level electives		6
B	Course Option (3 courses)	9	698 Master's Project, or 699 Master's Thesis		6 6
C	Course Option (3 courses)	9	Two CEE 600-level electives		6
D	698 Master's Project, or 699 Master's Thesis	6 9	698 Master's Project, or 699 Master's Thesis		6 6
<i>Total non-elective credits</i>		<i>30 to 33</i>	<i>Total non-elective credits</i>		<i>21</i>
MRP electives		3 to 6	General Electives (500 or 600 level)		9
<b>Total MRP credits</b>		<b>36</b>	<b>Total MS CE credits</b>		<b>30</b>
<b>Total Dual-Degree Program Credits</b>					<b>66</b>

**Sample Program Timeline and Special Course Descriptions (see Table 3 for summary)**

*The First and Second Years:*

Dual-degree Students in their first year will fulfill core requirements for either the MRP or the MS CE program; during their second year, they will focus on coursework in the other program. Students can elect to take an introductory graduate GIS course in either program during the first year. There are also a small number of elective credits available during the student’s first year in the MRP program where a student would be able to take either MS CE program core courses or MRP/ MS CE electives.

**Table 3**  
**Sample Program Timetable (assumed starting in MS CE Program)**

	Fall Semester	Spring Semester
<b>1<sup>st</sup> Year:</b>	MS CE Curriculum <b>(15 credits)</b> 4 MS CE Courses + RP 620 Quant Methods	MS CE Curriculum <b>(15 credits)</b> 4 MS CE Courses + RP 635 Research Issues
<b>Summer:</b>	2 Courses = 6 Credits of approved summer elective curriculum	
<b>2<sup>nd</sup> Year</b>	MRP Curriculum <b>(15 credits)</b> 3 MRP core courses (651, 630, 675), and one MRP elective = 15 credits	MRP Curriculum <b>(15 credits)</b> 2 MRP core courses (625, 656), plus either Master's Thesis/3-course Option or MRP Project + 1 MRP elective
<b>= 66 total credits over two years plus summer(s)</b>		

*Regional Planning Studio:*

Dual degree students will be required to participate in the regional planning studio. In the studio, students divide into teams of c. 4-6 students each and work on a 'real' planning project with an actual client. Contracts between the client and the studio team are signed as a means of providing a 'real-world' studio experience. Tasks will include data collection, analysis, and development of plan alternatives, public participation, and recommendations or plan implementation. Dual-degree students must have coursework in quantitative (statistics) methods and GIS before studio.

**Administration of Program:**

1. Applicants are expected to apply to each program individually, and to meet the respective admission requirements for each program. Once admitted to both programs, a student will qualify for the dual-degree program. Applicants to each program are expected to take the GRE. In addition, applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL). Students who may already be enrolled in one of the programs can apply for entry into the other during their first year in that program.
2. Advising: In the MRP phase of the dual program, students will be primarily advised by the Graduate Program Director of the MRP program. In the MS CE phase of the dual program, students will be primarily advised by the Transportation Engineering Program Leader. Students will have access to the advisors in both programs at all times.

### **Summary of Changes:**

1. Students complete the required 30-33 core credits of the MRP program plus 3-6 electives for a total of at least 36 credits in the MRP program.
2. Students complete the required 21 core credits of the MS CE program, for a total of at least 30 credits in the MS CE program.
3. Candidates apply to each program separately. Students in the first year of either program may apply to the dual degree program.

This proposal thus meets the overall dual degree requirement of a minimum 30 credits in each program and a minimum of at least 60 credits total with a total degree requirement of 66 credits (36 in the MRP, 30 in MS CE). The reduction of degree credits in the combined MRP/MS CE is well below the 20-25% threshold listed in the Dual Master's Proposal Guidelines as approved by the Faculty Senate, and in accordance with those guidelines still requires all core courses, and only reduces credits with elimination of duplicative concentration electives, while allowing a student to complete the program within 2 years plus summer(s) vs. three years. Students in the existing MRP program will be able to count 9 credits of MS CE program courses as fulfilling the MRP concentration requirement. Likewise, students in the existing MS CE program will be able to take 3 courses, or 9 credits, of electives outside of the MS CE program. As a result, there is no reduction in core requirements for either MS CE or MRP students. Students will meet all requirements of both programs and both degrees will be awarded concurrently upon completion of 66 total credits. **No additional resources will be required to support this dual-degree program.**