

# PLAN OF STUDY

## Department of Civil and Environmental Engineering Doctor of Philosophy in Civil Engineering Specialization in Construction Materials

**Student's Name (Please type or print)**

**Student's UIN**

**Anticipated Degree Date**

**E-mail address**

**Mailing address**

**Academic Advisor (Please type or print)**

The Construction Materials faculty has established these requirements for the PhD degree and for qualification (admission to PhD candidacy). The objective of these requirements is to assure that the students have adequate preparation through coursework for pursuing a PhD in construction materials. The required courses provide a broad knowledge in construction materials as well as a minimum knowledge in civil engineering, both of which the faculty deem necessary for PhD candidacy.

### Coursework

The student must complete 400- or 500- level courses in the following categories (a list of suitable courses is attached):

1. Construction Materials – Concrete, Metals, Polymers (including related materials such as composites, wood and asphalt), and Soils. A minimum of three courses dealing with at least two of these materials is required. Courses taken for the MS degree may be used to satisfy this requirement.
2. Engineering Behavior – Mechanics, Durability, Testing, and Design. A minimum of two courses in two of these three areas is required. Courses taken for the MS degree may be used to satisfy this requirement.

The PhD requires at least 32 hours of coursework and 32 hours of thesis research. Approximately 20 hours must be in the areas of Construction Materials and Engineering Behavior. Eight of the remaining hours must be taken from the attached list.

At least 12 hours of the coursework must be at the 500 level; of these, 8 hours must be on the attached list.

Exceptions to these requirements must be approved by the Construction Materials faculty.

Requirement	Course	Credit (H)	Semester
<i>Materials</i>			
<i>Eng. Behavior</i>			
<i>Elective</i>			

**TOTAL CREDIT**

### Notes on filling out the Plan of Study

List any transfer courses by course number at offering institution (these courses must be approved, by petition, by the Graduate College). Include a brief description of these courses on an attached separate sheet. Fill out the Plan of Study in ink.

Submit the completed form to Joan Christian in 1108 Newmark by the end of your first semester as a PhD student in Construction Materials with a copy to your academic advisor.

### Required Signatures

\_\_\_\_\_  
**Student** **Date**

\_\_\_\_\_  
**Academic Advisor** **Date**

\_\_\_\_\_  
**Chair of Construction Materials Faculty** **Date**

# Ph.D.

## Materials Courses

### **Materials**

#### **Concrete**

- CEE 401 Concrete Materials
- CEE 502 Advanced Concrete Chemistry

#### **Metals**

- MSE 441 Metals Processing
- MSE 442 Metals Laboratory
- MSE 443 Design of Engineering Alloys

#### **Polymers**

- CEE 405 Asphalt Materials I
- MSE 450 Intro to Polymer Sci and Eng
- MSE 452 Polymer Laboratory
- MSE 453 Plastics Engineering
- TAM 427 Mechanics of Polymers

#### **Other**

- CEE 483 Soil Mechanics and Behavior
- NRES 487 Soil Chemistry
- MSE 489 Matl Select for Sustainability

### **Engineering Behavior**

#### **Mechanics**

- CEE 470 Structural Analysis
- CEE 471 Structural Mechanics
- CEE 575 Fracture and Fatigue
- CEE 570 Finite Element Methods
- CEE 598FF Fracture of Plain and Fiber Concrete
- CEE 598THM Theory of Heterogeneous Materials
- CEE598CB Concrete at Multi-scale
- ME 430 Failure of Engrg Materials
- ME 532 Fracture Resistant Design
- MSE 440 Adv Mechanical Prop of Solids
- MSE 540 Advanced Mechanical Behavior
- TAM 424 Mechanics of Structural Metals
- TAM 428 Mechanics of Composites
- TAM 451 Intermediate Solid Mechanics
- TAM 456 Experimental Stress Analysis
- TAM 524 Micromechanics of Materials
- TAM 525 Advanced Composite Materials

- TAM 551 Solid Mechanics, I
- TAM 552 Solid Mechanics, II
- TAM 555 Fracture Mechanics

#### **Durability**

- CEE 503 Deterioration of Construction Materials
- CEE 598IR Repair of Civil Infrastructure
- MSE 445 Corrosion of Metals

#### **Testing**

- CEE 498 KUC Exprmtl Meth in Stru & Mat
- CEE 501 Materials Characterization
- CEE 504 Infrastructure NDT

### **Design**

- CEE 406 Pavement Design, I
- CEE 462 Steel Structures, II
- CEE463 Reinforced Concrete, II
- CEE 467 Masonry Structures
- CEE 468 Prestressed Concrete
- CEE 469 Wood Structures
- CEE 506 Pavement Design, II
- CEE 560 Steel Structures, III
- CEE 561 Reinforced Concrete, III
- CEE 563 Reinforced Concrete, IV

### **Other Recommended Courses**

- GEOL 432 Mineralogy and Mineral Optics
- GEOL 436 Petrology and Petrography
- GEOL 440 Sedimentology and Stratigraphy
- MSE 401 Thermodynamics of Materials
- MSE 402 Kinetic Processes in Materials
- MSE 405 Microstructure Characterization
- MSE 406 Thermal-Mech Behavior of Matls
- MSE 420 Ceramic Matls and Properties
- MSE 480 Surfaces and Colloids
- MSE 481 Electron Microscopy & Diffract
- MSE 486 Selection of Eng Matls

### **Notes and Comments**

*(Include descriptions of transfer courses and justification of deviations from the pre-approved course list).*

### **Review Comments**

*(This section is reserved for comments by the faculty advisor or by the Construction Materials faculty).*