

Research Internship Information

Name: Properties of Ultra-High Performance Concrete and Its Application in Steel Bridge Deck for Senior Undergraduates and Postgraduates

Chinese Host University and Department: Shandong University - Civil Engineering

Eligibility Requirements: Students should have background in one of the following areas: civil engineering, material engineering, structural engineering, or pavement engineering. Students are required to conduct experiments related to cement based materials during the internship.

Research Internship Description: The topic of the project is properties of ultra-high performance concrete and its application in steel bridge deck. We developed a new type of ultra-high performance concrete based on the ECC by modifying the mix proportion and producing method. This new material is applied as the deck of the steel bridge, which is developing very fast in China. Due to the intrinsic shortcomings of the normal concrete and asphalt deck, the distress could appear during the first couple years. Therefore, the bridge deck should be repaired every several years. This material could solve these problems and extend the service life of the bridge. This research project studies the effects of materials, mix proportion, environment, and fiber orientation on concrete properties including mechanical properties, microstructures, impact resistance, carbonation, freezing-thawing, resistance to chloride penetration and so on. This ultra-high performance concrete will be applied as the deck of the steel bridge. The properties of the structure will also be investigated. During the internship, activities, for example visiting Confucius family mansion, will be organized to help students get familiar with Chinese.

✧Students are eligible to select“China Studies” courses during the internship period.“China Studies” is a comprehensive and interdisciplinary study area which combines sinology with contemporary China studies to form a new disciplinary. The courses are dedicated to educate those who aspire to become the professionals with broad knowledge and deep understanding of China.

Research Internship Objectives: After the internship, students should understand the basic theories for the design of the ultra-high performance concrete, be able to conduct the typical testing, such as SEM, resistance to freezing-thawing and so on, get familiar with Chinese standards. Students will also understand the performance of ultra-high performance concrete deck of the steel bridge. Another benefit of this internship is that students have

opportunities to work and study together with Chinese students. They will chance to thoroughly experience the Chinese culture and make lifelong friends.

Student Roles and Responsibilities: 1. Conduct the literature review related to the research and develop the experimental plan under the instruction of the advisor. 2. Study the Chinese testing standards related to the research. 3. Casting ultra-high performance concrete and bridge deck slab. 4. Conduct experiments, analyze data, and write report.

Hours per week: 20 hours per week

Grading: 60% (working time, lab performance, group talks, and team work) and 40%(independent performance on assigned tasks, e.g. report and optional defense)

Number of Internship Positions: 2

Research Internship Location: Xinglongshan Campus, Shandong University

Research Internship Dates: minimum three months in all year round

Supervisor(s) Name(s) and Contact Information: Supervisor :Zhi Ge

Email: zhige@sdu.edu.cn Tel: +86 15606419030

Administrative Contact Information: Ms. Ma Mengran, mamengran@sdu.edu.cn

Research Internship Code:
SDU-CLIC008

Website address:
<http://www.istudy.sdu.edu.cn/en/?c=index>

Host university application:
No

Research Internship Credit: 5 credits (similar like final graduation project)

Dormitory accommodation available: yes, on-campus International Student Dormitory is guaranteed.

Additional fees: (field trips, etc.) Aiming to maximize the students' learning outcomes and deepen their understanding of Chinese society, besides the professional teaching and research activities, the field trips are included in the program to visit some of the famous tourist attractions of Jinan city and Shandong Province, the homeland of Confucius and other great philosophers of Chinese history. Hiking, visit to natural springs, ancient temples as well as potential visit to a technology center is included.