

Soil-Structure Interaction

Overview

All civil engineering structures, irrespective of being simple or complex, founded in hard solid ground or in deep water offshore seabed, has to ultimately transfer the loads to the ground through a foundation. The load acting on a structure is dependent not only on the environment and location (for example wind, wave, temperature and unknowns related to climate change) but also on unpredictable natural hazards (for example Tsunamis and earthquake and its associated effects such as subsurface liquefaction). However, the performance criteria for a foundation is to transfer loads under all these loading scenarios during its life time to the soil underneath. Owing to the inherent complexity coupled with nonlinearity of the soil material, the interaction can be complex and needs to be dealt with during analysis and design. The complication further increases if the soil-structure system is subjected to dynamic loading such as earthquakes or vibration due to machines such as Offshore Wind Turbines. Recent advancements allows computational modelling to incorporate non-linearity in the analysis. It is now well established that Soil-Structure Interaction (SSI) can sometimes sometime to beneficial and sometimes detrimental. As a result, SSI became an important and integral part of Civil Engineering design due to the mass scale constructions on soft soils, reclaimed lands, in seismically active zones – arguably due to world population growth without increasing the habitable land. In fact, the habitable land is predicted to decrease due to impacts of climate change.

This course is will bring out the assumptions, theories and application methods for modelling soil-structure interaction for various typical field situations. This course is highly specialized and is aimed at faculty members with limited experience in SSI, motivated undergraduate and post graduate students in civil engineering. Practicing civil engineers will also find this course very helpful and refreshing. Course participants will learn these topics through lectures, hands-on tutorials and case studies.

This course is organized in ten small segments broadly put into two modules. Each segment will have two theory lectures and one tutorial after each of those lectures. It is hoped that this will create enthusiasm in the participants to apply the advanced theories into practical problems.

Modules	<p>A: General Introduction, Importance and Applications of Soil Structure Interaction (SSI), Soil Structure Interaction Parameters Dec 28 - Dec 31, 2015</p> <p>B: SSI Modelling and specific field applications Jan 4 – Jan 6</p> <p>Number of participants for the course will be limited to fifty.</p>
You Should Attend If...	<ul style="list-style-type: none"> ▪ you are a civil engineer or architect or engineer working in soil-structure interaction problems. ▪ you are a student or faculty from academic institution interested in learning soil-structure interaction and its modelling for field applications.
Fees	<p>The participation fees for taking the course is as follows:</p> <p>Participants from abroad : US \$200 Industry/Research Organizations: Rs. 8000/- Faculty members from academic Institutions: Rs. 4000/- Students (UG or PG): Rs. 1500/-</p> <p>The above fee include all instructional materials, tutorials and assignments, laboratory equipment usage charges, free internet facility. The accommodation for the participants can be arranged in nearby hotels on payment basis, if requested well in advance.</p> <p>The participants are requested to bring their own laptop for tutorial classes.</p>

The Faculty



Prof. Suby Bhattacharya

Chair Professor in Geomechanics
University of Surrey
United Kingdom

http://www.surrey.ac.uk/cee/people/professor_suby_bhattacharya/

Professor Subhamoy Bhattacharya (Suby) holds the chair in Geomechanics at the University of Surrey since October 2012. He is also an Adjunct Professor at Zhejiang University (China) also a visiting fellow at the University of Bristol. He previously held the position of Senior Lecturer in Dynamics at University of Bristol, Departmental Lecturer in Engineering Science at the University of Oxford, Junior Research Fellow at Somerville College (Oxford). Professor Bhattacharya earned his doctorate from the University of Cambridge investigating failure mechanisms of piles in seismically liquefiable soils. Professor Bhattacharya had many happy years working in the Civil/Offshore Engineering consultancy. His research interests include response of pipelines and piles in seismic areas including liquefiable soils, study of soil liquefaction using element tests, offshore foundations, Physical modelling of geotechnical problems including soil-structure interaction with particular emphasis to off-shore wind turbines.



Dr. Sumanta Halder

Assistant Professor in Civil Engineering
School of Infrastructure
IIT Bhubaneswar
<http://www.iitbbs.ac.in/profile.php/sumanta/>

Dr. Halder is a geotechnical expert, having done his PhD from IISc Bangalore on pile foundation in liquefiable soils. His research area includes energy geotechnics, soil-structure interaction, probabilistic geotechnics, dynamics of soil and foundation, computational geomechanics, experimental geotechnics.



Dr. Suresh R Dash

Assistant Professor in Civil Engineering
School of Infrastructure
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Dr. Dash is a structural engineer, having done PhD from the University of Oxford on Lateral Soil-Pile Interaction in Liquefiable Soils. His research interest includes structural dynamics & earthquake engineering, soil-structure interaction for pipelines and pile foundations, seismic design of bridges.

Venue:

School of Infrastructure
IIT Bhubaneswar, Samantapuri,
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Course Coordinator

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Register for the course at:

<http://www.gian.iitkgp.ac.in/GREGN>

Last date of Registration:
12th Dec 2015