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CIVIL AND ENVIRONMENTAL ENGINEERING

DOCTORAL PROGRAM 2025-2026



Alberto Maria Gambelli is Assistant Professor at the Department of Civil and Environmental Engineering (DICA), University of Perugia. His research spans Energy and Chemical Engineering, with a focus on renewable and alternative energy sources. His main research topics include CO_2/CH_4 replacement in natural gas hydrate reservoirs and the valorisation of agro-industrial residues through anaerobic co-digestion. Since 2022, he has been included in Stanford University's annual "World's Top 2% Scientists" list. He has received awards for best paper and/or presentation at several national and international conferences, including the World Congress on Mechanical, Chemical, and Material Engineering (MCM) and the World Sustainable Energy Days (WSED). His teaching activities focus on Chemical Engineering and currently include Fundamentals of Chemical Processes and Technologies for Sustainable Chemical Processes.

PHASE EQUILIBRIUM IN MULTICOMPONENT SYSTEMS

Instructor

Alberto Maria Gambelli
Assistant Professor, University of Perugia

Course description

The course explores phase equilibrium in ideal multicomponent mixtures, focusing on the pressure and temperature conditions under which liquid and gaseous phases coexist with different compositions according to component volatility.

These principles underpin numerous industrial and technological applications. In flash separation units, for example, a single-phase mixture is separated into a gas stream enriched in the more volatile components and a liquid stream containing predominantly the less volatile ones; their compositions can be con-

pressure, facilitating subsequent treatment or use. Phase equilibria also form the basis of absorption processes for removing contaminants from gaseous streams, including sulfur compounds and acid gases.

The course therefore provides a detailed understanding of equilibrium in multiphase mixtures, together with practical applications of these concepts, including those relevant to the construction industry.

Course Schedule (9 hours, 1.5 CFU)

09/10/2026	14:30-17:30
16/10/2026	14:30-17:30
23/10/2026	14:30-17:30

Location

Room 17
Campus of Engineering
University of Perugia Via G. Duranti, 93 - Perugia

Kindly confirm the attendance by email
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