

ECI Topical Subcommittees

Subcommittee

Description

Biological and Medical Technology

Beth Junker and Joye Bramble,
Co-chairs

The Biological and Medical Technology Subcommittee sponsors conferences in areas of biotechnology that deal with issues in biochemical engineering and its interfaces with related engineering and science disciplines, and in biomedical areas which combine the application of engineering principles and techniques to the medical field. We are interested in topics which address technological challenges for production of biological products (varying in size and complexity from molecules to cells to tissues), spanning those which cross over to biology as well as engineering disciplines. Common biomedical engineering applications include the development of biocompatible prostheses, diagnostic and therapeutic medical devices, imaging equipment such as MRIs and EEGs, biotechnologies such as regenerative tissue growth, bio-nanotechnology, and pharmaceutical drugs and biopharmaceuticals. Among our historical and current conferences with a focus on biological technology are: Enzyme Engineering, Biochemical Engineering, Cell Culture Engineering, Recovery of Biological Products (now an ACS-sponsored conference), Metabolic Engineering, Vaccine Technology, Cell Therapy, Natural Products, and Bioenergy. Conferences series with a focus on biomedical technology include Light-Activated Tissue Regeneration and Therapy, Advances in Optics for Biotechnology, Medicine and Surgery, and Engineering Cell Biology.

Chemical Engineering

Franco Berruti, Chair

The Chemical Engineering Subcommittee seeks to organize conferences on subjects with strong chemical engineering content. Technical aspects of such meetings typically include analysis and control of chemical reactions with emphasis on heat, mass, and momentum transfer and chemical kinetics. Peripheral aspects include environmental concerns, safety, energy management, and sustainability of chemical operations. Strong series have evolved on such topics as chemical reaction engineering, chemical engineering separations, process Intensification, polymer reaction engineering, computational fluid analysis in chemical engineering, and water treatment and reuse. Chemical engineering issues with strong biology content are referred to the Bioengineering and Biomedical Subcommittees.

Education

Herm Bieber, Chair

The Education Subcommittee seeks to organize conferences on engineering education which benefit from ECI's interdisciplinary and international strengths (note that ASEE

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holds an increasing number of small, ECI size, workshops on the U.S. engineering education scene). Past ECI meetings have featured the role of women engineers, research on how to teach engineering principles, better ways to organize engineering schools (as a business), curricula accreditation and assessment problems, new technologies for the engineering classroom and life long education of engineers, global prospects for graduate education for engineering students, teaching entrepreneurial engineering, and how to incorporate important ancillary concerns like safety, ethics, environmental concerns and sustainability in the standard engineering curricula.

Energy

Hamid Arastoopour, Chair

The goal of the Energy Subcommittee is to promote conferences that address issues related to providing a clean, sustainable energy supply. As one of the most compelling issues of our time, “energy” is necessarily a broad, multidisciplinary topic, and potential conference topics are wide-ranging. The Subcommittee aims to provide some focus by concentrating on engineering challenges in specific areas such as solar, wind, hydro, and clean bio and fossil energy and in the system-wide management of power production and distribution, particularly related to the electrical grid. Conferences are especially encouraged that focus on the development of alternate and clean energy sources (both components and systems), deployment, and integration into the energy distribution system.

Environmental and Civil Engineering

Paul Bishop, Chair

The Environmental and Civil Engineering Subcommittee focuses on the development of conferences which are concerned with a goal of enhancing infrastructure and environmental stewardship to protect the public health and safety and improve the quality of life. To this end, this subcommittee seeks to organize conferences that explore cutting-edge fundamental and applied research and educational activities.

Environmental engineering conferences focus on understanding the impacts of human activities on public health, natural environmental quality, and natural resources. They emphasize the scientific and engineering basis for identifying, analyzing, solving, mitigating, or managing environmental problems to enable minimizing solid, liquid, and gaseous discharges into land, inland and coastal waters, and air that result from human activity. This emphasis includes evaluating adverse impacts of these discharges on sustainable human health and environmental quality. Example topical areas may include modeling and predicting the fate and transport of contaminants in aquatic, terrestrial

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and atmospheric systems; biological, chemical and physical treatment processes to remove and degrade contaminants from these systems; or the production of potable water, wastewater renovation suitable for reuse, and investigating the use of nanotechnologies in treatment.

Civil engineering conferences focus on classical Civil Engineering topics such as geohazards and composite construction, as well as, concentrating on structural, geotechnical, transportation and mechanics topics. A wide range of topics are emphasized, including flexible electronics, which is especially relevant in sensor applications in structural, geotechnical, transportation and mechanics system designs. As further examples, renewed interest in concrete formulation and composite construction, and more recently in wood construction, wind engineering, weather-induced disasters, and earthquake risk mitigation are prime areas for discussion at conferences. All of the conferences reinforce the goal of a sustainably built environment.

Environmental engineering and civil engineering topics have cross-cutting interest among industrial, academic and governmental communities.

Frontiers of Engineering Science (Emerging Technologies)

Herm Bieber, Chair

A new committee, Frontiers of Engineering Science (aka Emerging Technologies), has been formed to capture topics in new and emerging technologies on the frontiers of engineering science. This new subcommittee will sponsor conference ideas across multiple disciplines and subcommittees. Example: Sustainability beyond environment and energy.

Material Science

Ram Darolia, Chair

The Materials Science Subcommittee seeks to organize conferences on emerging technologies with a strong material content. A broad spectrum of materials science and engineering topics are covered including basic science, development, processing, properties, performance, and applications of advanced materials. Inter-disciplinary aspects of materials are emphasized. Recent conferences have dealt with materials for various energy applications, environmental protection, biomaterials, nano-materials, electronic material devices, sensors, stress corrosion, lubrication, and materials for high temperature and high performance applications. Metallic and non-metallic (ceramics, glass, composites, carbon based materials, polymers) materials serve as the basis for these conferences.