

National Technical University of Athens (NTUA), Greece



Founded at about the same time with the Greek State, after the Revolution of Independence of 1821-1828, NTUA is the oldest and most prestigious University of Greece in the field of engineering, and contributes unceasingly to the country's scientific, technical and economic development. NTUA is also the modern symbol of young people's resistance and fight for democracy. The University consists of nine Academic Schools; eight of them deal with pure engineering sciences including Architecture, and one with applied mathematics and physics. Five-year undergraduate studies lead to the Master in Engineering. In this context the 8500 undergraduate students and the graduates of NTUA, with strong background in Sciences and Technology are prominent members of our modern democratic society. About 15% of NTUA graduates continue doctorate studies. Furthermore, NTUA launched a few years ago 15 one-year interdisciplinary postgraduate programs, such as Energy Production and Management, Environment and Development, etc.

The - about 700 - members of the staff in the Schools, together with 2000 post-graduate researchers, apart from their teaching and related educational activities, conduct research work assisted by post-graduate students and a considerable number of external collaborators; the amount and the high standards of this research are proved by the numerous publications in International Scientific Journals and Proceedings of International Conferences as well as by the increasing number of research projects financed by the EU and other Greek and foreign organizations of the public and the private sector; it is worth mentioning the leading role of NTUA in EU-funded research projects.

OVERVIEW OF ACTIVITIES ON SUSTAINABLE DEVELOPMENT AT NTUA

The instinct of our individual and collective survival leads to the concept of sustainable development, related to the change in which the exploitation of resources, the direction of investments and the technological progress are in harmony, thus enhancing two basic aspects: the continuation of existence and welfare of humankind, and the preservation of the environment. Engineers are the professionals who have to design, build, construct, manufacture, evaluate and operate technical works taking into consideration the above terms. Nowadays, technical works should be designed in balance with nature. Engineers should leave behind the conventional solutions of the past; they should re-evaluate the parameters of their work and look for new principles of thinking, new ways of implementation, and new inventions consistent with the concept of sustainable development.

A number of new courses, seminars, and practical training have emerged as a result of this concern, primarily due to the growing interest of NTUA students and research groups in various topics related to the sustainable development issues. Furthermore, new research areas are being investigated, such as:



- Environmental Observation and Monitoring Methods and Techniques.
- Environmental Protection Sciences and Technologies (ecological systems and pollution, air/water/solid/hazardous waste treatment, industrial emissions control, agricultural pollution control, environmental impact of transportation, environmental modeling, environmental impact of major works and activities, legal and institutional framework, sustainability parameters).
- Efficiency, Optimization, Simulation and Environmental Impact of Energy Systems (exergy analysis, thermoeconomics, integrated analysis, design and optimization of energy systems, intelligent systems, fuels, vehicle design, renewable energies, gas turbines, power plants, internal combustion engines, cogeneration, refrigeration and air-conditioning, energy conversion, chemical processes, unit operations, energy management and energy storage, diagnostics and control).
- Decision and policy making (economic and policy analysis about carbon tax, EC Kyoto compliance strategy, greenhouse gas emission trading, ozone layer issues and global warming, water resources management).
- Social, Legal, Political, Economic and Cultural Aspects of Development.
- Environmentally friendly applications (bioclimatic design, bioclimatic architecture, use of environment friendly and renewable materials, environmental parameters in urban and regional planning, transport planning, food engineering, biotechnology, biomechanics, design and construction methods, concrete technologies, metallurgy, mineralogy, petrology and economic geology, restoration and conservation of monuments and traditional buildings etc).

Several networks, centers and committees related to sustainable development have been established in NTUA, and they act as State Consultants. Some of these are the Renewable Energy Sources Committee, the Athens real-time Congestion Map, the National Data Bank of Hydrological Meteorological Information, and the Metsovion Interdisciplinary Research Center for the protection and development of mountainous environment and local European cultures.