

School of Civil Engineering
College of Engineering
University of Tehran



School of Civil Engineering



School of Civil Engineering

The School of Civil Engineering (SCE) started its activities in 1934, as one of the first four departments of the College of Engineering at University of Tehran. This school, as the oldest Civil Engineering school in Iran, has a distinguished history and a tradition of excellence in teaching, research, and engineering practice.

Currently, the School of Civil Engineering has about 520 BSc, 400 MSc and 200 PhD students. The graduate programs offer advanced professional education leading to the degrees of Master of Science (MSc) and Doctor of Philosophy (PhD) in the following fields:

1. Structural Engineering
2. Earthquake Engineering
3. Construction Engineering and Management
4. Water Resources Engineering and Management
5. Hydraulics and Hydraulic Structures
6. Coastal, Ports and Marine Structures Engineering
7. Environmental Engineering
8. Geotechnical Engineering
9. Road and Transportation

The School of Civil Engineering has 53 full-time faculty members including 18 Professors, 15 Associate Professors, 20 Assistant Professors, and 1 Lecturer. Education in SCE prepares students for leadership in the profession of civil engineering. Many notable industry pioneers and political leaders are graduates of this school

Several internationally recognized research projects on the application of innovative methods in the fields of structural analysis and design, maintenance and repair of structures, design of hydraulic and marine structures, optimal design of water distribution and wastewater collection networks, water resources planning and management, geotechnical engineering, environmental systems analysis and advanced computational mechanics have been successfully carried out at this prestigious school.



School of Civil Engineering

Establishment of the Center of Excellence for Engineering and Management of Civil Infrastructures, approved by Iran's Ministry of Science, Research and Technology, shows the strength of this school in conducting multi-disciplinary research activities.

The school laboratories and research centers are among the best in Iran, providing opportunities for all students to gain practical experiences. Furthermore, the large computer center of the school with its advanced facilities serves the academic staff and students.

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International Reputation



International Reputation

The School of Civil Engineering has a distinguished international reputation for education and research. Our graduates are well received by high-ranked national and international universities for higher educations and major corporates and organizations all over the word for engineering practices. Moreover, our academic staff are influencing members of many international scientific committees, with highly-cited papers and book publications that are assumed as the main textbooks of several courses at higher education levels.

For instance, the main reference book publications of our academic staff in the new millennium are:

- Mohammadi, S. (2012) XFEM Fracture Analysis of Composites, Wiley, UK.
- Karamouz, M., Nazif, S. Falahi, M. (2012), Hydrology & Hydroclimatology, CRC Press, USA.
- Karamouz, M., Ahmadi, A. Akhbari, M. (2011), Groundwater Hydrology: Engineering, Planning and Management, CRC Press, USA.
- Karamouz, M., Moridi, M., Nazif, S., (2010), Urban Water Engineering and Management, Taylor and Francis Publishing, CRC Press, USA.
- Mohammadi, S. (2008) Extended Finite Element Method, Wiley/Blackwell Publishers, UK.
- Mohammadi, S. (2003) Discontinuum Mechanics using Finite and Discrete Elements, WIT Press, UK.





Computer Center



Computer Center

The computer center of school supports students, faculty members and staff in various IT-related tasks including providing internal networks LAN and wireless infrastructure. Two separate sites are assigned to undergraduate and graduate students; both equipped with personal computers, main servers, and servers access points. A new computing unit has been launched for graduate students to support the need for long-running (in the order of days/weeks) computing jobs.



Center of Excellence for Engineering & Management of Civil Infrastructures



Center of Excellence for Engineering and Management of Civil Infrastructures

Recent developments in social, economic, industrial and urban systems require a new vision toward design, construction, and operation management of Infrastructures. Even though many fields related to design of infrastructure have significantly evolved during the recent decades, many technical and managerial gaps still exist in infrastructure operation planning and management, maintenance and rehabilitation. Areas such as prevention and management of critical situations related to infrastructure failures due to natural disasters such as earth quacks, floods, and droughts and human induced risks such as terrorist attacks require multi-disciplinary integrated approached toward design, operation, and maintenance of infrastructures.

The aim of the Center of Excellence for Civil Infrastructure Engineering and Management (CECIEM) is to address the aforementioned gaps by involving 13 faculty members from UT School of Civil Engineering, EMPA Material Science and Technology in Switzerland, Semnan University, and Amirkabir University of Technology in Iran. Research in the CECIEM centers around five major themes:

- Gas and Oil transfer and distribution systems
- Water and wastewater infrastructure
- Transportation infrastructures
- Coastal infrastructure
- Green infrastructure in urban areas

CEIEM research and educational activities aim to enhance the resiliency of the nation's civil infrastructures. With an emphasis on outputs-oriented research, education and capacity building, CEIEM will explore the technical, socio-economic, and managerial requirements for operation, maintenance, and design of sustainable infrastructures.







Construction Materials Lab
Construction Materials Institute



Construction Materials Lab/Construction Materials Institute

The Construction Materials Laboratory of University of Tehran was established in the early days of the Faculty of Engineering foundation in 1946. The Lab is one of the most reliable construction materials laboratory centers in Iran; being accredited as a reference laboratory by most national organizations. This laboratory acts collectively with the Construction Materials Institute (CMI) of University of Tehran, founded in 2001, and provides a wide range of technical services, including testing of cementitious materials, quality control of concrete on site, assessment of concrete structures and consultancy in relation to concrete technology. The goals of Construction Materials Lab/Institute are to facilitate the transfer of academic insight to the construction industry and to address the needs for knowledge-based solutions in the construction sector. Numerous industrial research projects related to the durability of concrete, health monitoring, repair, rehabilitation and corrosion assessment of concrete infrastructure, performance-based quality control of concrete and controlled concrete mixture design have been conducted. The main research orientations are:

- Concrete Structures Assessment and Repairing in the Persian Gulf Region,
- Fiber Reinforced Concrete,
- Self-Consolidating Concrete,
- Persian Gulf Durability Investigation Sites,
- Flow-able Fill,
- Lightweight Concrete,
- Pozzolans,
- Concrete in Sewerage Environment,
- Decorative Concrete

The CM Lab/Institute includes the following facilities and equipment: Freeze-Thaw Chamber and Test Equipment; Pull off Strength Measurement Apparatus; Los Angeles Resistance Abrasion Apparatus; Profile Grinder; Concrete Cover Meter; Concrete Creep Test Room; Four-point Electrical Resistivity Measurement Device (Wenner array probe); Plastic & Drying Shrink-



-age of Concrete Measurement System; Oxygen Concrete Permeameter; Concrete Core Drill Apparatus; Water Impermeability Apparatus; Concrete Compression and universal compression, flexural, tensile testing machines, RCPT test equipment, and Impace echo pundit plus.

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High Performance Computing Lab



High Performance Computing Lab

The High performance computing Laboratory (HPC Lab) has been extensively involved in various research-oriented activities involving high performance computing of engineering and physical applications. Home developed sequential and massively parallel (CPUs, GPUs and clusters) computational softwares are available for large scale simulations on high-tech computational hardwares. HPC-lab is extensively engaged in major national engineering projects by providing accurate numerical solutions for complex problems. Moreover, the Lab is an internationally- renowned research leader in the fields of extended finite element method (XFEM), meshless methods, multiscale simulations and, recently, biomechanics applications.

In addition to providing the required software and hardware platforms for numerical research across the school, the HPC-lab has established the following major research groups:

1- Development of advanced numerical techniques, such as XFEM and multiscale methods

2- Blast and Explosion loadings on structures

3- Multiscale Center

4- Biomechanics applications

5- Car Impact and accident simulation center

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Hydraulics and Fluid Mechanics Lab



Hydraulics and Fluid Mechanics Lab

The Hydraulic and Fluid Mechanic Laboratory, as one of the oldest laboratories of school, is used for both graduate researches and undergraduate hydraulic laboratory classes. There is a range of experimental set-ups through which undergraduate students are given a very good demonstration to understand various methods of measurement of flow rates, capacity & velocity of water in tanks, closed pipes and open channels. The laboratory is equipped with a new 25 m long wave flume for research topics in the fields of shore and offshore engineering.

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Pavement Lab



Pavement Lab

The pavement laboratory is dedicated to education and research on topics related to various road pavement design or behavior.

In the educational unit, specifications of bituminous such as flash point, softening point, penetration, ductility and say bolt viscosity are determined. Also, students are allowed to make asphalt samples with definite aggregates size and shape in order to design asphalt mix. Graduate students are become familiar with advanced laboratory tests which are conducted on asphalt concrete.

In the research unit, research activities, mostly related to mechanical and physical properties of flexible pavements, are conducted. Indirect tensile, static creep, dynamic creep, beam fatigue and gyratory compaction are among the tests that can be conducted in different controlled temperatures using an environmental chamber.

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Rock Mechanics Lab



Rock Mechanics Lab

The Rock Mechanics Laboratory of school was established in 2006 for both educational and research purposes. Various rock tests such as unconfined compressive strength, point load strength index, direct shear, slake durability and determination of water content and specific gravity are conducted. This lab is equipped with coring, trimmer and cut-off machines for samples preparation for the point load and uniaxial compressive tests and also oven and freezer for the freeze and thaw test.

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Soil Mechanics Lab



Soil Mechanics Lab

The Soil Mechanics Lab was established in 1934, and is one of the oldest laboratories of the School of Civil Engineering. In recent years, it has been further expanded into three major sections, namely Soil Mechanics, Advanced Soil Mechanics and Soil Dynamics and Physical Modeling sections. Being well equipped with modern testing facilities, all sections of the laboratory have effectively involved in educational and research activities as well as collaboration with the industry on various research subjects in the field of geotechnical engineering.

1- Soil Mechanics Section

This lab maintains conventional soil mechanics testing equipments which are primarily used in undergraduate educational programs as well as engineering services to consultant companies.

2- Advanced Soil Mechanics and Soil Dynamics Lab

This lab is equipped with advanced static and dynamic element testing units including conventional and stress path Static Triaxial, large and small size Dynamic Triaxial, Resonant Column, large and small size Dynamic Hollow Cylinder and Simple Shear testing devices, as well as special components for measuring small-strain properties of geomaterials including bender elements and local displacement and proximity sensors. Besides, a section of the lab maintains a complete set of geophysical instruments for refraction, reflection and down-hole seismic surveys. Combination of all these advanced systems provides a unique opportunity for conducting sophisticated tests on geomaterials both for educational and research purposes. Researchers in the lab are engaged in testing of the soil behavior subjected to static, earthquake and dynamic loading conditions.



3- Physical Modeling Lab

Modern physical modeling devices of this lab provide an opportunity for researchers to simulate behavior of different types of earth structures subjected to static or seismic loadings. The facilities of this lab consist of a one-degree-of-freedom shaking table, a geotechnical centrifuge, a calibration chamber with laboratory CPT device, a split box to simulate faulting and model containers in different sizes. The lab is equipped with different types of precise measuring units including transducers and data acquisition systems.

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Structures Lab



Structures Lab

The Structures Laboratory, inaugurated in 2002, is a relatively modern and well-equipped research center in Iran. Several national and international students in the PhD and MSc levels are active in the educational and research activities of the lab. The research programs include both scientific and professional projects.

Prominent facilities of the Structures Lab include:

1. Solid base, built of steel beams and reinforced concrete slab
2. Powerful 50KN Crane
3. Three sets of different loading tests: static, cyclic and dynamic loading instruments on different types of structures such as frame structures, walls, beams, and columns.
4. Accurate data acquisition instruments including static and dynamic data loggers, strain gages and LVDTs.

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Engineering Surveying Lab



Engineering Surveying Lab

Whether it is structural, road construction, bridge construction, tunnelling, hydraulic structure, water and wastewater or even environmental project, "Engineering Surveying" stands as a necessary tool in all phases of planning, predesign, design, construction and supervision. To fulfil such goal, the Surveying Laboratory of University of Tehran, with approximately eight decades of activity, has managed to gather some of the most up-to-date equipment available. From old tapes, chains and compasses to a diverse set of laser tapes, theodolites, levels and total stations, this laboratory has almost all the necessary equipment to teach undergraduate students about both historic and modern approaches of engineering surveying.

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Water and Environmental Measurement and Monitoring Lab



Engineering Surveying Lab

The WatEnv laboratory is equipped with a number of enhanced laboratory and field measurement devices to measure and monitor physical and chemical parameters of water reservoirs and environment. The laboratory formed in 2011 when some of its equipments were setup and applied, however it started to work officially from May 2015.

Several sets of measurements that are available in the WatEnv laboratory can be listed as:

- Laboratory measurement of physical and chemical parameters in water and soil samples by applying devices such as Atomic Absorption with furnace and flame, High Pressure Liquid Chromatography (HPLC), Photometers, Spectrophotometers in visible and UV ranges, Flame Photometers, BOD and COD meters and so on.
- Field measurement of physical and chemical parameters in surface waters including rivers and reservoirs by using portable and online devices like ultrasonic velocity meters and KLL-Q2.
- Field measurement of physical and chemical parameters of groundwater and subsurface layers by using KLL-Q2 and geo electromagnetic devices (in both KHz and MHz frequency ranges).
- Measurement of wind velocity and some air pollution parameters by using portable handheld devices.
- Underwater inspection of seabed and reservoir underwater hydraulic structures up to 300 meters depth by using remotely operated vehicle (ROV) system.

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