



University of Isfahan

Faculty of Civil Engineering and Transportation

An Introduction to the Faculty of Civil Engineering and Transportation (CET)

**University of Isfahan
Iran**

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1. Introduction

The University of Isfahan, founded in 1946, is one of the leading universities in Iran. It is a public, comprehensive institution encompassing a broad range of research and study fields, including science, engineering, social sciences, and humanities. The university is nationally recognised for its outstanding programmes, which prepare its diverse student body for both academic and professional success. The entire campus is situated in the heart of Isfahan, a city renowned for its beauty and historical heritage. The university has over 15,000 enrolled students, and more than 700 staff members.

The Faculty of Civil Engineering is one of the seventeen faculties at the University of Isfahan, known for its national and international academic collaborations and scientific activities.

2. Faculty of Civil Engineering and Transportation (CET)

The Faculty of Civil Engineering and Transportation (CET) comprises three departments:

- 1) Civil Engineering (CE)
- 2) Geomatics Engineering (GE)
- 3) Railway Engineering and Transportation Planning (RETP)

The Department of Geomatics Engineering was established in 1988, and the Department of Civil Engineering followed in 2004. The Department of Railway Engineering and Transportation Planning began as the Faculty of Transportation Engineering, the first of its kind in Iran, in 2008. In 2016, a new faculty—the Faculty of Civil Engineering and Transportation—was formed when the Faculty of Transportation Engineering merged with the Departments of Civil Engineering and Geomatics Engineering.

3. Faculty Mission

The mission of the Faculty of Civil Engineering and Transportation includes:

1. Training talented and knowledgeable engineers.
2. Conducting high-quality and applied research in the fields of Civil Engineering, Geomatics Engineering, and Railway Engineering and Transportation Planning.
3. Developing research in new and effective technologies within these fields.
4. Producing and disseminating theoretical and practical knowledge at both national and international levels.
5. Contributing to sustainable development on national and international scales.
6. Establishing effective engagement with industry and society to address real-world challenges and foster innovation.

4. Majors Offered

The Faculty of Civil Engineering and Transportation offers the following majors:

Department of Civil Engineering:

- 1. Civil Engineering (B.Sc.)**
- 2. Structural Engineering (M.Sc. and Ph.D.)**
- 3. Geotechnical Engineering (M.Sc.)**
- 4. Water Resources Engineering and Management (M.Sc. and Ph.D.)**
- 5. Environmental Engineering (M.Sc.)**
- 6. Hydraulic Structures (M.Sc.)**
- 7. Construction Management (M.Sc.)**

Department of Geomatics Engineering:

- 1. Geomatics Engineering (B.Sc.)**
- 2. Remote Sensing (M.Sc. and Ph.D.)**
- 3. Geodesy (M.Sc. and Ph.D.)**
- 4. GIS (M.Sc. and Ph.D.)**
- 5. Photogrammetry (M.Sc. and Ph.D.)**

Department of Railway Engineering and Transportation Planning:

- 1. Railway Track and Structures Engineering (B.Sc.)**
- 2. Railway Rolling Stock Engineering (B.Sc.)**
- 3. Transportation Engineering (M.Sc.)**
- 4. Railway Track Engineering (M.Sc. and Ph.D.)**
- 5. Transportation Planning Engineering (M.Sc.)**
- 6. Railway Transportation (M.Sc.)**
- 7. Electric Railway Engineering (M.Sc.)**

5. Research Priorities of the Faculty at International Level

The Faculty of Civil Engineering and Transportation at the University of Isfahan engages in extensive academic collaboration, including staff mobility, student exchange, joint research projects, and webinars, with universities, faculties, and departments across Europe, America, Africa, and Asia.

The Faculty is currently in the process of establishing the *UNESCO UNITWIN Network focused on Structural Restoration and Disaster Risk Management of Architectural Heritage* at the University of Isfahan. The Network unites the expertise of 9 universities, 2 intergovernmental organisations and 1 governmental entities spanning 10 countries across Asia, Africa, South America, and Europe. With such diverse collaboration, the network prioritises interdisciplinary, multidisciplinary, and cross-regional research to create resilient heritage sites.

The Faculty's research and academic collaboration at the international level focus on the following key areas:

1. Disaster Mitigation, Management and Climate Change Adaptation
2. Disaster Risk Management of Architectural Heritage
3. Structural Restoration of Architectural Heritage
4. Water Quality and Wastewater Treatment
5. Environmental Policy and Governance
6. Reliability and AI in Structural Design
7. Advanced Concrete Technology and New Materials
8. Atmospheric Modelling in Digital Twin
9. Natural Resources Monitoring with AI
10. Sustainable Development using SDI
11. Land Administration Systems and Cadastre
12. Computational Movement Analysis
13. Electric Transportation Systems
14. Electric Vehicle
15. Digital Twin and Metaverse

6. Department of Civil Engineering (CE)

6.1. Research Areas

1. Architectural Heritage
2. Climate Change
3. Coastal Engineering
4. Cold-Formed and Light-Weight Steel Structures
5. Composite Materials and Structures
6. Computational Mechanics
7. Disaster Risk Management
8. Earthquake Engineering
9. Environmental Engineering
10. Fluid-Structure Interaction
11. Geotechnical Engineering
12. Historical Structures
13. Micro- and Nano-Mechanics
14. Numerical Methods
15. Optimisation Methods in Engineering
16. Seismic Dissipating Devices
17. Structural Health Monitoring
18. Structural Stability
19. Water and Wastewater Treatment

20. Water Resources Planning and Management

6.2. Facilities

- **Computer Lab**
for general use by undergraduate and graduate students
- **Structural Engineering Lab**
mainly use for research purposes, this lab supports experimentally the students and faculties offering the modern systems available in its field such as: Data Acquisition Systems, Servo-Hydraulic Actuators, Servo-hydraulic Compression Testing Machine, Hydraulic Jacks, and Rigid Frames, etc.
- **Soil Mechanics Lab**
used for educational, research and industrial purposes, for testing physical and mechanical properties, both in-situ and ex-situ, of various types of soils and rocks.
- **Construction Materials and Concrete Lab**
measuring mechanical strength and other technical properties of various construction materials including concrete, brick, cement, gypsum, mortar, and aggregate.
- **Open Channel Hydraulics Lab**
mainly for educational and research purposes, studying properties of open flow and hydraulic jump in channels, properties of flow in passing through sluice gate, and flow rate measurement by various types of weirs.

6.3. Topics on Industry-Academia Collaboration

1. Modern methods of seismic assessment of structures and their applications
2. Monitoring, management, and environmental engineering
3. Assessment of ground vibrations and their effects on structures
4. Numerical research in structural engineering
5. Hydraulics of the sea and sediment and erosion engineering
6. Study, analysis and restoration of traditional structures and architectural heritage
7. Application of modern methods for assessing geotechnical materials and structures
8. Development of innovative methods in solving issues in the field of water engineering
9. Analysis and assessment of extreme hydrological events (floods and droughts) and the risks associated with them
10. Geotechnics and material behaviour
11. Comprehensive waste management
12. Economic, social, institutional, and environmental studies in water and wastewater resource management

6.4. Completed Key Projects in Industry-Academia Collaboration

Field of Project	Project Title	Funder/Client
Structural Health Monitoring and Bridge Engineering	Investigation of the load-bearing capacity of abutments and piers of the existing railway bridge from Isfahan to Sistan.	Navrood Complany
	Modern and optimized methods for the repair and maintenance of bridges in the city of Isfahan and the proposal for a smart real-time monitoring network for the city's bridges.	Isfahan Municipality
Seismic Hazard Analysis	Comprehensive seismic microzonation plan and seismic risk management for the city of Isfahan.	Isfahan Municipality
Concrete Technology and Materials	Feasibility study of using high-diameter and high-strength rebars in the design of concrete buildings.	Kavir Steel Complex
Seismic Dampers and Isolators	Development of new yielding and viscoplastic dampers for structural control against earthquakes and wind.	Iran National Science Foundation (INSF)
Water and Wastewater Treatment	Review and provide solutions to enhance national educational campaigns in the water and wastewater industry of the country.	National Water and Wastewater Engineering Company
	Quality monitoring of water before entering the water treatment plant to the last point of consumption.	Isfahan Province Water and Wastewater Company
Water Resources Quality Modeling and Management	Modeling and environmental assessment of development projects in the Zab basin and other related basins.	Iran Water and Power Resources Development Company
Environmental Engineering and Management	Environmental impact assessment studies of various projects, including green space water supply and sewage collection networks.	Hydro Pars Company
Waste Management	Comprehensive waste management plan for urban and rural areas of Isfahan province.	Department of Environment, Isfahan Province
Design and Strengthening of Industrial and Building Structures	Rehabilitation and strengthening of Shahid Beheshti metro station in Isfahan.	Isfahan Urban and Suburban Railway Organization
	Project for strengthening the crane structure of the continuous casting unit at Mobarakeh Steel Complex.	Esfahan Steel Company (ESCO)
	Design of a pharmaceutical production building (twenty thousand square meters).	Raha Pharmaceutical Company
Application of Satellite-Based Information in Water Resources Studies	Application of remote sensing data in refining the parameters of the water resources balance (Semirom basin).	Isfahan Regional Water Company
Flood and Drought Management	Spatial-temporal drought propagation analysis using complex network theory in Iran.	Iran Water Resources Management Company
Surface and Groundwater	Application of water, energy, and environmental nexus concepts in the economic evaluation of various water transfer methods.	Iran Water Resources Management Company

Resources Management	Development of methodology and evaluation of the interaction between surface and groundwater resources in the country.	Isfahan Regional Water & Tarbiat Modares University
Artificial Intelligence	Use of satellite-based data to determine the actual inflow to the reservoir (case study: Zayandeh-Rud Dam).	Iran National Science Foundation
Restoration and Strengthening of Historical Buildings	Restoration and reconstruction of an adobe chamber in the bazaar of the Bam citadel	Ministry of Cultural Heritage, Tourism and Handicrafts of Iran
Crisis Risk Management	Disaster risk management plan of the World Heritage Site of the Naqsh-e-Jahan square complex in Isfahan	Ministry of Cultural Heritage, Tourism and Handicrafts, Isfahan Province
Traditional and Modern Materials	Structural restoration plan for the historical mausoleum of Ala-o-Doleh in Semnan	Ministry of Cultural Heritage, Tourism and Handicrafts, Semnan Province
Geotechnical studies and Dam Construction	Head of the geotechnical and instrumentation section of the Gotvand Dam.	Iran Water and Power Resources Development Company
Reinforced Soil	Rehabilitation design of the reinforced soil structure of the Ghadir Freeway.	Ministry of Roads and Urban Development

6.5. Joint/Dual Degree Programmes (In English Language)

1. Structural Engineering (M.Sc.)

6.6. Short-Term Courses with Certificate (In English Language)

1. Traditional and Innovative Methodologies for Structural Restoration of Architectural Heritage (32 hours/or/16 hours/or/8 hours)
2. Disaster Risk Management Plan of Heritage Buildings and Sites (32 hours/or/16 hours/or/8 hours)
3. Traditional Structures (32 hours/or/16 hours/8 hours)
4. Earthen and Adobe Buildings (4 hours)
5. Seismic Performance of Masonry Buildings (4 hours)
6. Non-destructive (NDT) and Minor-Destructive (MDT) Test Methods for Characterisation of Architectural Heritage Construction Materials (6 hours)
7. Effect of Scale on Mechanical Properties of Masonry Materials (4 hours)
8. Operational Modal Analysis (OMA) of Dynamic Properties of Brick Masonry Arches (4 hours)
9. ISCARSAH Recommendations for the Analysis, Conservation and Structural Restoration of Architectural Heritage (2 hours)
10. History of Persian Architecture (16 hours/or/8 hours)
11. History of Persian Islamic Architecture (16 hours/or/8 hours)
12. Smart Cities and Zero Energy Buildings (2 hours)
13. Cold Formed Steel Structures (48 hours/or/32 hours/or/16 hours/or/8 hours/or/4 hours)
14. Construction Management (48 hours/or/32 hours/or/16 hours/or/8 hours)
15. Surface Water Quality Management: Principles and New Approaches (32 hours)

16. Sustainability and System Thinking in Water Resources (8 hours)

7. Department of Geomatics Engineering (GE)

7.1. Research Areas

1. Development of positioning, reconnaissance, recognition, extraction, and modelling of phenomena based on imaging and LiDAR technologies
2. Precision boosting and GNSS and INS application development and gravitational missions
3. Precision improvement and information extraction from remotely sensed data to develop applications in Earth sciences, environmental hazards and mapping
4. Development of spatial multi-criteria decision algorithms
5. Development of satellite remote sensing applications in environmental studies, prediction and fighting natural hazards using solutions for spatial precision and resolution boosting
6. Monitoring crustal deformation under natural hazards using numerical methods and classical and modern geodetic observations
7. Remote sensing engineering for the urban map production and local environmental parameters estimations
8. Land administration and cadastre
9. Computational movement analysis
10. Free software for GIS

7.2. Facilities

- GIS Laboratory
- Surveying Equipment Storage and Laboratory
- Remote Sensing Laboratory
- GPS Permanent Station Laboratory
- Photogrammetry laboratory

7.3. Topics on Industry-Academia Collaboration

1. Using deep learning, machine learning, and computer vision algorithms in processing spatial data and applications in photogrammetry and remote sensing
2. Research and development of algorithms related to positioning, identification, detection, extraction, and modelling of subjects and phenomena based on images and LiDAR
3. Enhancing accuracy and developing applications for INS, GNSS data, and attractive missions
4. Improving the accuracy of information extraction from remote sensing data to develop applications in earth sciences, environmental hazards, and mapping
5. Developing spatial group decision-making methods, machine learning, and computational intelligence
6. Developing applications of satellite remote sensing data in environmental studies, predicting, and mitigating natural disasters by providing solutions to enhance their accuracy and resolution
7. Monitoring and analysing changes in the Earth's crust due to natural hazards using numerical methods and classical and modern geodetic observations

8. Remote sensing engineering for producing urban maps and estimating local environmental parameters
9. Land administration systems for sustainable development
10. Modelling and analysing the dynamics of movement

7.4. Completed Key Projects in Industry-Academia Collaboration

Field of Project	Project Title	Funder/Client
Geodesy and Surveying	An evaluation of land subsidence using radar interferometry in Rafsanjan desert	Asaco – Kerman Provincial Electricity Company
	Monitoring of observation and computation of Isfahan Metro line #2 surface control points' coordinates	Karaneh Sazan Engineering Company
	Satellite positioning of the control points network of Qods site – Isteghlal square metro line	Isfahan Municipality Civil Company
	Determination of the displacement of embankment dams using GPS observations	Isfahan Regional Water Company
	Determination of Isfahan city local geoid	Isfahan Municipality ICT Organization
	Determination of the planimetric and topographic base plan of Mobarake city	Mobarake Municipality
	Fundamental GPS studies of Isfahan city	Isfahan Municipality ICT Organization
Geographical Information System (GIS)	Development of total software solutions for electricity and gas distribution companies and electricity transmission company	Electric Power and Gas Distribution Companies
	Tehran municipality comprehensive zoning plan enterprise and web GIS implementation	Tehran Municipality ICT
	A landuse planning study and Isfahan province development document using strategic planning for a spatial database	Isfahan Provincial Government
	The feasibility analysis of a spatial database creation for Foulad Mobarake complex	Foulad Mobarake company
	Digitization and revision of Isfahan city zoning price boundaries	Isfahan Municipality ICT
	GIS ready and import of spatial data into the geoportal of an SDI	Isfahan Municipality ICT
	Giving technical solutions regarding the spatial database, SDI, and GISs of Isfahan municipality ICT organization	Isfahan Municipality ICT
	University of Isfahan spaces management GIS	University of Isfahan
	An estimation of the crop area of agricultural products	National Elite Foundation
Remote Sensing	Sensitivity analysis of SWAT rainfall runoff model to applied surveying scale from free remotely sensed images. Case study: upstream Zayanderoud dam	Iran Water Resource Management Organization

An estimation of influx of water to a dam reservoir using remotely sensed satellite data (case study: Zayanderud dam)	Iran National Science Foundation (INSF)
Compute MODIS aerosol AOD and regression to PM _{2.5}	Isfahan Cardiovascular Research Institute
Local model derivation for the transformation of MODIS satellite data derived aerosol AOD to PM ₁₀	Isfahan Cardiovascular Research Institute
Design and manufacturing of a navigation system based on computer vision	Ministry of Science, Research and Technology
Smart 3D optical laser scanner construction with the capability of automatic digitization of boundary lines	Ministry of Cultural Heritage, Tourism and Handicrafts
Evaluation of the amount of deformation of oil reservoir using close range photogrammetry	Oil Company of Tehran Province
3d model construction of historical places using photogrammetry using drone: case study: Qaleh Izadkhast	Ministry of Cultural Heritage, Tourism and Handicrafts
Geometry derivation of a positioning system using stars imaging	Ministry of Science, Research and Technology
1:500 mapping using a drone	Design Services Department of Isfahan Provincial Government
The study, quality control, and evaluation of Fouladshahr maps using drone photogrammetry	Fouladshahr Municipality

7.5. Joint/Dual Degree Programmes (In English Language)

GIS Engineering (M.Sc.)

7.6. Short-Term Courses with Certificate (In English Language)

1. Animal Movement Data Analysis with R (12 hours)
2. Geospatial Information Systems Lab with QGIS, SAGA, GRASS and Python (16 hours)
3. Spatial Data Analysis with R (16 hours)
4. Crop Mapping Using Remote Sensing & Geospatial Information System (4 hours)
5. Remote Sensing Techniques for Soil Moisture Assessment (16 hours)

8. Department of Railway Engineering and Transportation Planning (RETP)

8.1. Research Areas

21. Analysis and Design of Rigid and Flexible Pavement
22. Recycled Construction, Demolition Waste and Materials in Pavement
23. Geometric design of roads and railways

24. Polymer Modified Bitumen (PMB)
25. Flexible Pavement (Analysis and Design)
26. Pavement Management System (PMS)
27. Sustainable Materials in Road Pavement
28. Self-Healing in Pavement Layers
29. Railway Intelligent Transportation System (RITS)
30. Data Science (Data-Mining, Machine Learning, Neural Network)
31. Network Modelling and Optimisation
32. Railway Transportation Planning/Scheduling
33. Multiple Criteria/Objective Decision Analysis Methods
34. Project and Strategic Management
35. Transportation Planning
36. Railway Transportation
37. Network Design Problems
38. Disaster Response Routes
39. Railway Capacity
40. Railway Noise and Vibration
41. Railway Track Maintenance Management Systems
42. Metro Systems
43. Analysis and Design of Ballasted and Slab-track Systems
44. Optimisation of Railway Track
45. Field Investigation on Dynamic Behaviour of Railway Substructure and Superstructure Systems
46. Train-Track Interaction
47. Dynamics of Railway Bridges
48. Numerical Modelling
49. Masonry Railway Arch Bridge Dynamic Behaviour
50. New Methods of Underground Structures Construction (Metro Stations)
51. Supply System of Electric Railway (AC and DC)
52. Analysis of Overhead Contact Systems
53. Control of Electrical Traction Motors Drives
54. Linear Motors & MAGLEVs
55. Power Electronics
56. Propulsion System of Electric Trains
57. Metro Rectifier Substations (RS)
58. High Voltage Direct Current (HVDC) Systems
59. Grid Connected Photovoltaic Systems

8.2. Facilities

- Road and Rail Transport Superstructure Laboratory
- Health Monitoring of Infrastructures Laboratory
- Structures Laboratory
- Electric Railway Laboratory
- Intelligent Computing Laboratory
- Rolling Stock Laboratory

8.3. Topics on Industry-Academia Collaboration

1. Improving the performance of road and railway pavement layers while considering sustainable development issues

2. Experimental analysis of railway lines
3. Development and design of intelligent rail transport systems
4. Pavement and subgrade of roads
5. Railway engineering in the field of infrastructure, buildings, and rail structures
6. Feeding systems and control of electric drives
7. Interaction between track and train
8. Analysis of railway bridges
9. Modern methods for designing and constructing metro stations
10. Transport planning and economics
11. Propulsion systems for electric trains
12. Rail vibrations
13. Design of railway pavements
14. Dynamics of railway lines

8.4. Completed Key Projects in Industry-Academia Collaboration

Field of Project	Project Title	Funder/Client
Metro and Railway	Field study of measurement of vibration of subway lines and vibration isolation of Khaneh Shahr building in Tehran, located in the northern area of Imam Khomeini Square	Civil Organization of Tehran Municipality
	Studying and evaluating the vibrations and sound reaching residential, commercial and historical buildings in the area of Tehran subway line 6 and providing corrective solutions if necessary	Tehran Urban Railway Company
	Performing engineering services in order to carry out preferential studies of rail vibration of Qom subway line A project	Qom Urban Railway Company
Safety and Traffic	Providing a safety proposal for the movement of pedestrians and disabled people on the level of Ahmedabad square and the streets connected to the square	Isfahan Municipality
Planning and Decision Making	Train scheduling under demand uncertainty	Isfahan Steel Company
Intelligent Transportation	Determining the optimal location of passenger stations and optimizing the route, the number and type of the commuter vehicles for the Isfahan Oil Refining Company	Isfahan Oil Refining Company
Road Pavement	Preparation of technical guidelines for the use of cold emulsion asphalt	Sang & Kooh Company
	Using bitumen modified with rubber powder in the black base layer	Zarin Bitumen Refinery
	Investigating the causes of sliding cracks in highways	Eskandeh Company

Metro and Electric Railway	Investigating the condition of Isfahan metro earthing and bonding system, extracting problems, and providing solutions for correction and improvement	Isfahan Regional Metro Company
	Simulation of the 20kV power supply system in Isfahan metro line one	Isfahan Regional Metro Company
	Optimal management and reduction of electricity consumption in urban electric rail transport networks using energy recycling	Center for International Scientific Studies & Collaborations (CISSC), Ministry of Science, Research, and Technology of Iran
New Methods of Design and Construction of Underground Structures and Subway Stations	Compilation of code and guidelines for the underground structures with top-down method	Ministry of Road & Urban Development
	Investigating the precast concrete column to beam connection based on coupling system	F.B.S Corporation
	Compilation of a guide for concrete reinforcing systems	Iranian Concrete Institute
Disaster Response Routes Network Design	Large scale disaster response routes network design	Tehran Disaster Mitigation and Management Organization
Railway Transportation and Railway Capacity	Railway capacity calculation and evaluation software using GIS	Islamic Republic of Iran Railways
Economics and Transportation Planning	Educating and consulting in Applying Data Mining Tools in Transportation	Iran Ministry of Roads & Urban Development

8.5. Joint/Dual Degree Programmes (In English Language)

Railway Tracks Engineering (M.Sc.)

8.6. Short-Term Courses with Certificate (In English Language)

1. Dynamic Modeling and Simulation of Electrical Machines Using Matlab/Simulink (10 hours)
2. Predictive Control of Modern Power Electronic Converters (8 hours)
3. Railway Capacity (8 hours)
4. Transportation Network Modeling (8 hours)

9. Staff

9.1. Department of Civil Engineering

 Faculty of Civil Engineering & Transportation University of Isfahan Department of Civil Engineering 	 Faculty of Civil Engineering & Transportation University of Isfahan Structural Engineering
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Mehrdad Hejazi Prof. of Structural Engineering and Architectural Heritage • Masonry Structures and Materials • Traditional and Historical Structures • Structural Restoration of Architectural Heritage • Structural Health Monitoring • Steel Structures and Composite Materials • New Construction Techniques and Materials • Disaster Risk Management of Historical Sites and Buildings  Email: m.hejazi@eng.ui.ac.ir https://engold.ui.ac.ir/~m.hejazi/	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Hossein Tajmir Riahi Assoc. Prof. of Structural Engineering • Performance-based seismic design • Endurance time analysis • Optimum seismic design of structures • Dampers and Base isolations • Structural health monitoring • Ground motions selection methods • Seismic analysis of bridges  Email: tajmir@eng.ui.ac.ir https://engold.ui.ac.ir/~tajmir/
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Farshid Mossaiby Assoc. Prof. of Structural Engineering • Numerical methods • Parallel and scientific programming • Crack nucleation and propagation  Email: mossaiby@eng.ui.ac.ir https://eng.ui.ac.ir/~mossaiby	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Maryam Daei Assoc. Prof. of Structural Engineering • Structural Optimization & Reliability • Metaheuristic Techniques & Artificial Intelligence • New Materials and Structures • Graph Theory  Email: m.daei@eng.ui.ac.ir https://engold.ui.ac.ir/~m.daei/

 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Mehran Zeynalian Prof. of Structural Engineering • Structural Performance of cold formed steel structures • Seismic performance of 3D-Panel structural systems • Analytical description of cyclic performance of structures • Design of mechanical fuse insulator for LV power transmission line • Vibration based damage detection and structural health monitoring • Risk analysis and management of constructional projects  Email: m.zeynalian@eng.ui.ac.ir https://engold.ui.ac.ir/~m.zeynalian/	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Hossein Amoushahi Assoc. Prof. of Structural Engineering • Composite Structures • Numerical Methods • Plates and Shells Analysis • Structural Stability • Design of Steel Structures  Email: h.amoushahi@eng.ui.ac.ir https://engold.ui.ac.ir/~h.amoushahi/
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Hamed Haftbaradaran Assoc. Prof. of Structural Engineering • Computational mechanics of materials • Multi-physics modeling in solid mechanics • Mechanics of energy storage materials (Li-ion batteries and hydrogen-storage systems) • Nanomechanics • Thin film materials; Fracture mechanics  Email: h.haftbaradaran@eng.ui.ac.ir https://engold.ui.ac.ir/~h.haftbaradaran/	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Mahdi Zandi Assist. Prof. of Structural Engineering • Steel structures • Composite structures • Energy dissipating systems • Numerical methods • Computational mechanics  Email: s.m.zandi@eng.ui.ac.ir https://engold.ui.ac.ir/~s.m.zandi/
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Abdolreza Ataei Assist. Prof. of Structural Engineering • Prefabricated structures • Steel-concrete composite structures • Analytical and numerical modelling • Timber-concrete composite structures • Deconstructable and sustainable structures • New Construction Techniques and Materials • Seismic performance assessment of buildings • Cold-formed steel-concrete composite structures • Performance assessment of buildings subjected to fire  Email: a.ataei@eng.ui.ac.ir https://engold.ui.ac.ir/~a.ataei/	 Faculty of Civil Engineering & Transportation University of Isfahan

 Faculty of Civil Engineering & Transportation University of Isfahan Environmental Engineering	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Ali Dehnavi Assist. Prof. of Environmental Engineering • Water & Wastewater Treatment, Recovery & Reuse • Treatment Processes Optimization • Water Quality Assessment • Environmental Monitoring • Solid Waste Management  Email: a.dehnavi@eng.ui.ac.ir https://engold.ui.ac.ir/~a.dehnavi/
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Shervin Jamshidi Assist. Prof. of Environmental Engineering • Water Quality Modeling and Management • Environmental Justice and Governance • Wastewater Treatment and Reuse • Waste Load Allocation (WLA) • Grey Water Footprint (GWF)  Email: sh.jamshidi@eng.ui.ac.ir https://engold.ui.ac.ir/~sh.jamshidi/	 Faculty of Civil Engineering & Transportation University of Isfahan Geotechnical Engineering
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Mahmoud Hashemi Assoc. Prof. of Geotechnical Engineering • Investigating the behavior of the earth (geotechnics) and materials • Stability analysis and stabilization of geotechnical structures (slope, tunnel, foundation, excavation) • Characterising, modeling and improvement of materials (traditional, masonry, concrete)  Email: m.hashemi@eng.ui.ac.ir https://eng.ui.ac.ir/~m.hashemi	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Meysam Mashayekhi Assist. Prof. of Geotechnical Engineering • Development and implementation of constitutive models for geomaterials • Computational geomechanics • Reinforced soils • Polymeric materials  Email: m.mashayekhi@cet.ui.ac.ir https://cet.ui.ac.ir/~m.mashayekhi

 Faculty of Civil Engineering & Transportation University of Isfahan Water Resources Engineering and Management	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Ahmad Shanehsazzadeh Assoc. Prof. of Hydraulics  Email: a.shanehsazzadeh@eng.ui.ac.ir https://eng.ui.ac.ir/~a.shanehsazzadeh • Coastal and River Engineering • Coastal Hydrodynamics and Environment • Sediment Transport • Water Resources Management
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Ramtin Moeini Assoc. Prof. of Water Resources  Email: r.moeini@eng.ui.ac.ir https://eng.ui.ac.ir/~r.moeini • Optimization • Water resource planning and management • Sewer network design and analysis • Water network design and analysis • Artificial Intelligent	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Hamed Yazdian Assist. Prof. of Water Resources  Email: h.yazdian@eng.ui.ac.ir https://engold.ui.ac.ir/~h.yazdian/ • Water Resource Planning and Management • Environmental and Water Resource Engineering • Sustainability of Aquatic Ecosystems • Water Quality Management • Water Governance
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Mohammadali Alijanian Assist. Prof. of Water Resources (Hydrologist)  Email: m.alijanian@eng.ui.ac.ir https://eng.ui.ac.ir/~m.alijanian • Water Resources Management • Hydrometeorology • Drought Forecasting • Flood Forecasting • Utilizing Satellite Products in Hydrology • Hydro-informatics • Stochastic Hydrology • Climate Change	

9.2. Department of Geomatics Engineering

 Faculty of Civil Engineering & Transportation University of Isfahan Department of Geomatics Engineering 	 Faculty of Civil Engineering & Transportation University of Isfahan Geodesy
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Jamal Asgari Assoc. Prof. • Geodesy: Satellite Geodesy • GNSS: NRTK, GPS/GNSS Meteorology, GNSS-R, ... • Inertial Navigation • Industrial and Engineering Surveying  Email: asgari@eng.ui.ac.ir https://eng.ui.ac.ir/~asgari	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Hamid Mehrabi Assist. Prof. • Satellite interferometry (InSAR) • Deformation analysis of the crust • 3D displacement field through InSAR • Time series analysis • Approximation Methods • Geodetic networks analysis  Email: h.mehrabi@eng.ui.ac.ir https://eng.ui.ac.ir/~h-mehrabi
 Faculty of Civil Engineering & Transportation University of Isfahan Eng. Abdol-Hossein Moossavi Alkazemi Assist. Prof. • Physical and satellite Geodesy • Precise Levelling • Deformation Analysis • Time Series Analysis • Gravity Data Processing  Email: hmoossavi@surv.ui.ac.ir https://eng.ui.ac.ir/~hmoossavi	 Faculty of Civil Engineering & Transportation University of Isfahan

 Faculty of Civil Engineering & Transportation University of Isfahan Remote Sensing	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Mehdi Momeni Prof. • Deep Learning Image Processing • Urban/Rural Mapping • Remote Sensing of Aerosols and Atmospheric Profiles • Remote Sensing of Vegetation Indexes and Soil Parameters (LST, Moisture, HyperSpectral) • Close Range Photogrammetry  Email: momeni@surv.ui.ac.ir https://eng.ui.ac.ir/~momeni
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Sayyed Bagher Fatemi Assist. Prof. • From Pixels to Knowledge: Exploring Image Analysis and Information Extraction in Remote Sensing • Mapping Our Planet: Utilizing Remote Sensing and LiDAR Data for Insights and Solutions • Mapping with Confidence: Accuracy Assessment • Beyond the Image: Fusion Techniques for Enhanced Information Extraction in Remote Sensing • Mapping the Landscape: Exploring the Potential of Remote Sensing Data for Environmental Applications  Email: sb.fatemi@eng.ui.ac.ir https://eng.ui.ac.ir/~sb.fatemi	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Mina Moradizadeh Assist. Prof. • Soil moisture retrieval through the combination of remote sensing sensors • Investigating the capabilities of passive microwave sensors in environmental modeling • Retrieve atmospheric parameters through remote sensing images • Applying machine learning in modeling based on satellite images  Email: m.moradizadeh@eng.ui.ac.ir https://eng.ui.ac.ir/~m.moradizadeh
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Iman Khosravi Assist. Prof. • Crop mapping using optical and radar satellites • Object extraction from satellite images • Drought modeling and monitoring • Earthquake vulnerability assessment  Email: i.khosravi@cet.ui.ac.ir https://cet.ui.ac.ir/~i.khosravi	 Faculty of Civil Engineering & Transportation University of Isfahan

 Faculty of Civil Engineering & Transportation University of Isfahan Photogrammetry	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Mehran Satari Assist. Prof.  • Lidar Remote Sensing • Full Waveform Analysis • Point Cloud Analysis • 3D Modelling • Vision Based Navigation • Close-Range Photogrammetry Email: sattari@eng.ui.ac.ir https://eng.ui.ac.ir/~sattari
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Hossein Bagheri Assist. Prof. • Machine Learning / Deep Learning • Data Science in Earth Observation • Remote Sensing/Photogrammetry  Email: h.bagheri@cet.ui.ac.ir https://cet.ui.ac.ir/~h.bagheri	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Ali Abzal Assist. Prof.  • Close Range Photogrammetry and Computer Vision • Vision Metrology • 3D Optical Scanners • Industrial Photogrammetry • UAV Photogrammetry Email: a.abzal@cet.ui.ac.ir https://cet.ui.ac.ir/~a.abzal
 Faculty of Civil Engineering & Transportation University of Isfahan Geospatial Information System (GIS)	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Jamshid Maleki Assist. Prof.  • Computational intelligence and machine learning in spatial science • Game theory and group decision making • Spatial multi-objective optimization • Urban land use planning Email: j.maleki@cet.ui.ac.ir https://cet.ui.ac.ir/~j.maleki

 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Farid Cheraghi Assist. Prof. • Land administration and cadastral systems • Computational movement analysis • Free and open source software for GIScience  Email: f.cheraghi@cet.ui.ac.ir https://cet.ui.ac.ir/~f.cheraghi	 Faculty of Civil Engineering & Transportation University of Isfahan Emeritus
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Asadollah Karimi • GIS • Cadastre • Urban construction and planning 	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Alireza Amiri-Simkooei Prof. • GNSS algorithm and positioning • Artificial intelligence and machine learning • Geodetic time series analysis • Estimation and approximation theory • Seafloor bathymetry and classification 
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Vahhab Nafisi (1996-2021) Assist. Prof. • Tectonics • Geodynamics • Climatology • Meteorology • VLBI 	

9.3. Department of Railway Engineering and Transportation Planning

 Faculty of Civil Engineering & Transportation University of Isfahan Department of Railway Engineering and Transportation Planning 	 Faculty of Civil Engineering & Transportation University of Isfahan Transportation Engineering
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Mohsen Aboutaleb Eshfahani Assoc. Prof. of Transportation Engineering  Email: m.aboutalebi.e@ceng.ui.ac.ir https://ceng.ui.ac.ir/~m.aboutalebi.e • Analysis and Design of Rigid and Flexible Pavement • Recycled Construction, Demolition Waste and Materials in Pavement • Pavement Management System • Geometric design of roads and railways	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Ahmad Goli Assoc. Prof. of Transportation Engineering  Email: a.goli@trn.ui.ac.ir https://trn.ui.ac.ir/~a.goli • Polymer Modified Bitumen (PMB) • Flexible Pavement (Analysis and Design) • Pavement Management System (PMS) • Sustainable Materials In Road Pavement • Self Healing In Pavement Layers
 Faculty of Civil Engineering & Transportation University of Isfahan Railway Transportation	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Ahmad Reza Jafarian-Moghaddam Assist. Prof. of Railway Engineering - Operations  Email: ar.jafarian@trn.ui.ac.ir https://trn.ui.ac.ir/~ar.jafarian • Railway Intelligent Transportation System (RITS) • Data Science (Data-Mining, Machine Learning, Neural Network) • Network Modeling and Optimization • Railway Transportation Planning/Scheduling • Multiple Criteria/Objective Decision Analysis Methods • Project and Strategic Management

 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Nariman Nikoo Assist. Prof. of Railway Engineering - Operations • Transportation Planning • Railway Transportation • Network Design Problems • Disaster Response Routes • Railway Capacity  Email: n.nikoo@cet.ui.ac.ir https://cetold.ui.ac.ir/~n.nikoo/	 Faculty of Civil Engineering & Transportation University of Isfahan Railway Track Engineering
 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Mohammad Hasan Esmaeili Assist. Prof. of Railway Engineering - Track & Structures • Railway Noise and Vibration • Railway Track Maintenance Management Systems • Metro Systems • Analysis and Design of Ballasted and Slab-track Systems • Optimization of Railway Track • Field investigation on dynamic behavior of railway substructure and superstructure systems  Email: m.h.esmaeili@ceng.ui.ac.ir https://cengold.ui.ac.ir/~m.h.esmaeili/	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Meysam Jahangiri Assist. Prof. of Railway Engineering - Track & Structures • Train-Track Interaction • Dynamics of Railway Bridges • Numerical Modeling • Masonry Railway Arch Bridge Dynamic Behavior • New Methods of Underground Structures Construction (Metro Stations)  Email: m.jahangiri@cet.ui.ac.ir https://cetold.ui.ac.ir/~m.jahangiri/
 Faculty of Civil Engineering & Transportation University of Isfahan Electric Railway Engineering	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Pegah Hamedani Assist. Prof. of Electrical Engineering • Supply System of Electric Railway (AC and DC) • Analysis of Overhead Contact Systems • Control of Electrical Traction Motors Drives • Linear Motors & MAGLEVs • Power Electronics  Email: p.hamedani@ceng.ui.ac.ir https://ceng.ui.ac.ir/~p.hamedani

 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Mahmudreza Changizian Assist. Prof. of Electrical Engineering  Email: m.changizian@cet.ui.ac.ir https://cetold.ui.ac.ir/~m.changizian/ • Propulsion system of electric trains • Control of Traction Drives • Metro Rectifier Substations (RS) • High Voltage Direct Current (HVDC) systems • Grid Connected Photovoltaic Systems • Power Electronics	 Faculty of Civil Engineering & Transportation University of Isfahan
 Faculty of Civil Engineering & Transportation University of Isfahan Emeritus	 Faculty of Civil Engineering & Transportation University of Isfahan Dr. Gholamreza Shiran Assoc. Prof. of Transportation planning & Engineering  Email: gh.shiran@trn.ui.ac.ir • Transport / Traffic & Environment • Sustainable Transport • Non-motorised Transport • Road Traffic Safety • Public Transport • Transport & Traffic Impact Analysis & Assessment.

Appendix 1. Syllabi of Short-Term Courses with Certificate (In English Language)

A.1.1. Department of Civil Engineering

Course Title:	Traditional and Innovative Methodologies for Structural Restoration of Architectural Heritage
Duration:	32 hours (16 sessions of 2 hours)/or/16 hours (8 sessions of 2 hours)/or/8 hours (4 sessions of 2 hours) Note: The duration of this course can be adjusted for shorter courses as follows: • 16 hours (8 sessions of 2 hours each, with reduced content for each 'Item' in the 'Lecture Titles' section) • 8 hours (Item 1: 2 hours, Item 2: 1 hour, Item 3: 1 hour, Item 4: 1 hour, Item 5: 1 hour, Item 6: 2 hours)
Lectures titles:	1. Introduction to Architectural Heritage and Traditional Structures (6 hours) 2. Introduction to the Recommendations and Guidelines for Structural Restoration of Architectural Heritage (2 hours) 3. Non-destructive (NDT) and Minor-Destructive (MDT) Test Methods for Characterisation of Architectural Heritage Construction Materials (6 hours) 4. Monitoring Methods of Architectural Heritage (2 hours) 5. Traditional Construction Methodologies to Mitigate Earthquake Effects (2 hours) 6. Innovative Methodologies for Structural Restoration and Case Studies (6 hours) 7. Field Study (8 hours) 8. Project
References	Croci, G. (1998). <i>The conservation and structural restoration of architectural heritage</i> . WIT Press. Southampton and Boston. Hejazi, M., & Mehdizadeh, F. (2014). <i>Persian architectural heritage: Conservation</i> . WIT Press. Southampton and Boston.
Prerequisite:	Adequate knowledge of architectural heritage restoration
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Mehrdad Hejazi (Email: m.hejazi@eng.ui.ac.ir & mm.hejazi@yahoo.com)
Department:	Department of Civil Engineering

Course Title:	Disaster Risk Management Plan of Heritage Buildings and Sites
Duration:	32 hours (16 sessions of 2 hours)/or/16 hours (8 sessions of 2 hours)/or/8 hours (4 sessions of 2 hours) Note: The duration of this course can be adjusted for shorter courses as follows: • 16 hours (8 sessions of 2 hours each, with reduced content for each 'Item' in the 'Lecture Titles' section) • 8 hours (Item 1: 1 hour, Item 2: 1 hour, Item 3: 1 hour, Item 4: 2 hours, Item 5: 1 hour, Item 6: 2 hours)
Lectures titles:	1. Phases of Disaster Risk Management (2 hours) 2. Establishing the Context (4 hours) 3. Identifying Risks (4 hours) 4. Analysing Risks (6 hours) 5. Evaluating Risks (4 hours) 6. Case Study: Disaster Risk Management Plan of a World Heritage Site (4 hours) 7. Field Study (8 hours) 8. Project
References	Hejazi, M., & Mehdizadeh, F. (2014). <i>Persian architectural heritage: Conservation</i> . WIT Press. Southampton and Boston. Jigyasu, R., & Chmutina, K. (Eds.). (2021). <i>Routledge handbook on cultural heritage and disaster risk management</i> . Routledge. New York.
Prerequisite:	Adequate knowledge of architectural heritage restoration
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Mehrdad Hejazi (Email: m.hejazi@eng.ui.ac.ir & mm.hejazi@yahoo.com)
Department:	Department of Civil Engineering

Course Title:	Traditional Structures
Duration:	32 hours (16 sessions of 2 hours)/or/16 hours (8 sessions of 2 hours)/or/8 hours (4 sessions of 2 hours) Note: The duration of this course can be adjusted for shorter courses as follows: • 16 hours (8 sessions of 2 hours each, with reduced content for each 'Item' in the 'Lecture Titles' section) • 8 hours (Item 1: 2 hours, Item 2: 1 hour, Item 3: 1 hour, Item 4: 2 hours, Item 5: 1 hour, Item 6: 1 hour)
Lectures titles:	1. Earthen and adobe buildings (4 hours) 2. Brick buildings (2 hours) 3. Stone buildings (2 hours) 4. Wooden buildings (2 hours) 5. Seismic performance of masonry buildings (4 hours) 6. Structural behaviour of domes and minarets (2 hours) 7. Structural behaviour of arches and vaults (2 hours) 8. Authenticity of soil and foundation (2 hours) 9. Sacred geometry in architecture (2 hours) 10. ISCARSAH Recommendations for structural restoration of architectural heritage (2 hours) 11. Field Study (8 hours) 12. Project
References	Campbell, J., Bill, N., & Fidler, J. (2018). <i>Traditional structures: An introduction to building methods</i> . CRC Press. Boca Raton. Hejazi, M., & Mehdizadeh, F. (2014). <i>Persian architectural heritage: Structure</i> . WIT Press. Southampton and Boston.
Prerequisite:	Adequate knowledge of architectural heritage restoration
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Mehrdad Hejazi (Email: m.hejazi@eng.ui.ac.ir & mm.hejazi@yahoo.com)
Department:	Department of Civil Engineering

Course Title:	Earthen and Adobe Buildings
Duration:	4 hours (2 sessions of 2 hours)
Lectures titles:	1. Construction Technology 2. Anti-Earthquake Measures 3. Rammed Earth 4. Elements of Sustainability
References	Hejazi, M., & Mehdizadeh, F. (2014). <i>Persian architectural heritage: Structure</i> . WIT Press. Southampton and Boston. Minke, G. (2021). <i>Building with earth: Design and technology of a sustainable architecture</i> (3rd ed.). Birkhäuser. Basel.
Prerequisite:	Adequate knowledge of architectural heritage restoration
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Mehrdad Hejazi (Email: m.hejazi@eng.ui.ac.ir & mm.hejazi@yahoo.com)
Department:	Department of Civil Engineering

Course Title:	Seismic Performance of Masonry Buildings
Duration:	4 hours (2 sessions of 2 hours)
Lectures titles:	1. Earthquake Phenomenon 2. Seismic Performance and Causes of Damage 3. Experimental Simulation of Seismic Behaviour 4. Structural Concepts for Earthquake Resistant Masonry Buildings
References	Arya, A. S., Boen, T., & Ishiyama, Y. (2014). <i>Guidelines for earthquake resistant non-engineered construction</i> . UNESCO. Paris. Hejazi, M., & Mehdizadeh, F. (2014). <i>Persian architectural heritage: Structure</i> . WIT Press. Southampton and Boston.
Prerequisite:	Adequate knowledge of architectural heritage restoration
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Mehrdad Hejazi (Email: m.hejazi@eng.ui.ac.ir & mm.hejazi@yahoo.com)
Department:	Department of Civil Engineering

Course Title:	Non-destructive (NDT) and Minor-Destructive (MDT) Test Methods for Characterisation of Architectural Heritage Construction Materials
Duration:	6 hours (3 sessions of 2 hours)
Lectures titles:	Part 1: NDT Methods 1. Sonic Test 2. Impact Echo Test 3. Thermography 4. Georadar (GPR) 5. Magnetometry 6. Radiography 7. Dynamic Methods Part 2: MDT Methods 1. Rebound Test 2. In-Situ Mortar Joint Shear Test 3. Coring Test 4. Endoscopy 5. Flat Jack Test 6. Drilling Resistance Measurement System
References	American Society for Nondestructive Testing. (2011). <i>Nondestructive testing handbook (3rd ed.). Volume 1, Fundamentals of nondestructive testing</i> . American Society for Nondestructive Testing. Columbus. Croci, G. (1998). <i>The conservation and structural restoration of architectural heritage</i> . WIT Press. Southampton and Boston.
Prerequisite:	Adequate knowledge of architectural heritage restoration
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Mehrdad Hejazi (Email: m.hejazi@eng.ui.ac.ir & mm.hejazi@yahoo.com)
Department:	Department of Civil Engineering

Course Title:	Effect of Scale on Mechanical Properties of Masonry Materials
Duration:	4 hours (2 sessions of 2 hours)
Lectures titles:	1. Compressive Strength 2. Flexural Strength 3. Shear Strength 4. Bond Strength 5. Direct Tensile Strength
References	Moayedian, S. M., & Hejazi, M. (2021). Effect of scale on compressive strength of brick masonry with gypsum mortar. <i>Measurement</i> , 172, 108932. Moayedian, S. M., & Hejazi, M. (2021). Stress-strain relationships for scaled gypsum mortar and cement mortar brick masonry. <i>Journal of Building Engineering</i> , 33, 101861.
Prerequisite:	Adequate knowledge of architectural heritage restoration
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Mehrdad Hejazi (Email: m.hejazi@eng.ui.ac.ir & mm.hejazi@yahoo.com)
Department:	Department of Civil Engineering

Course Title:	Operational Modal Analysis (OMA) of Dynamic Properties of Brick Masonry Arches
Duration:	4 hours (2 sessions of 2 hours)
Lectures titles:	1. Fundamentals of Operational Modal Analysis (OMA) 2. Effect of Temperature on Dynamic Properties 3. Effect of Material Moisture Content 4. Effect of Arch Geometry 5. Effect of Damage 6. Effect of Repair 7. Numerical Modelling and Model Updating 8. Micro-Model versus Macro-Model 9. Effect of Arch Thickness 10. Effect of Support
References	Alaei, A., Hejazi, M., Vintzileou, E., Miltiadou-Fezans, A., & Skłodowski, M. (2023). Dynamic identification of brick masonry semi-circular arches due to temperature and moisture. <i>Structures</i> , 50, 148-160. Alaei, A., Hejazi, M., Vintzileou, E., Miltiadou-Fezans, A., & Skłodowski, M. (2023). Effect of damage and repair on the dynamic properties of Persian brick masonry arches. <i>The European Physical Journal Plus</i> , 138(3), 231.
Prerequisite:	Adequate knowledge of architectural heritage restoration
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Mehrdad Hejazi (Email: m.hejazi@eng.ui.ac.ir & mm.hejazi@yahoo.com)
Department:	Department of Civil Engineering

Course Title:	ISCARSAH Recommendations for the Analysis, Conservation and Structural Restoration of Architectural Heritage
Duration:	2 hours (1 session of 2 hours)
Lectures titles:	1. General Criteria 2. Research and Diagnosis 3. Remedial Measures and Controls
References	International Council on Monuments and Sites. (2003). <i>Principles for the analysis, conservation and structural restoration of architectural heritage (the Zimbabwe Charter 2003)</i> . ICOMOS. Paris.
Prerequisite:	Adequate knowledge of architectural heritage restoration
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Mehrdad Hejazi (Email: m.hejazi@eng.ui.ac.ir & mm.hejazi@yahoo.com)
Department:	Department of Civil Engineering

Course Title:	History of Persian Architecture
Duration:	16 hours (4 sessions of 2 hours and field study of 8 hours)/or/8 hours (4 sessions of 2 hours)
Lectures titles:	Part 1: Pre-Islamic Period (4 hours) 1. First Phases of Architecture and Building (Until 560 B.C.) 2. Stone Basements and Columns, Majestic Complexes (560-330 B.C.) 3. Dome on Squinches, Vaulted Structures (330 B.C.-224 A.D.) 4. Transverse Arch and Vault, Base Isolation (224.642 A.D.) Part 2: Islamic Period (4 hours) 1. Structures of Exceeding Beauty (642-1000 A.D.) 2. The Perfect Dome, the Double-Shell Dome (1000-1157 A.D.) 3. Verticality, Attenuation, Magnificence (1218-1334 A.D.) 4. Refinement (1314-1502 A.D.) 5. Culmination, Town Planning, Isfahan (1491-1722 A.D.) 6. Persistence of Traditional Styles (1722-94 A.D.) 7. Adaptation to Modern Influences (1794 A.D.-present) Part 3: Additional Activities 1. Field Study (8 hours) 2. Project
References	Hejazi, M. (1997). <i>Historical buildings of Iran: Their Architecture and Structure</i>. WIT Press. Southampton and Boston. Hejazi, M., & Mehdizadeh, F. (2014). <i>Persian architectural heritage: Architecture</i>. WIT Press. Southampton and Boston.
Prerequisite:	Adequate knowledge of architectural heritage restoration
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Mehrdad Hejazi (Email: m.hejazi@eng.ui.ac.ir & mm.hejazi@yahoo.com)
Department:	Department of Civil Engineering

Course Title:	History of Persian Islamic Architecture
Duration:	16 hours (4 sessions of 2 hours and field study of 8 hours)/or/8 hours (4 sessions of 2 hours)
Lectures titles:	Part 1: Islamic Period (8 hours) 1. Structures of Exceeding Beauty (642-1000 A.D.) 2. The Perfect Dome, the Double-Shell Dome (1000-1157 A.D.) 3. Verticality, Attenuation, Magnificence (1218-1334 A.D.) 4. Refinement (1314-1502 A.D.) 5. Culmination, Town Planning, Isfahan (1491-1722 A.D.) 6. Persistence of Traditional Styles (1722-94 A.D.) 7. Adaptation to Modern Influences (1794 A.D.-present) Part 2: Additional Activities 1. Field Study (8 hours) 2. Project
References	Hejazi, M. (1997). <i>Historical buildings of Iran: Their Architecture and Structure</i>. WIT Press. Southampton and Boston. Hejazi, M., & Mehdizadeh, F. (2014). <i>Persian architectural heritage: Architecture</i>. WIT Press. Southampton and Boston.
Prerequisite:	Adequate knowledge of architectural heritage restoration
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Mehrdad Hejazi (Email: m.hejazi@eng.ui.ac.ir & mm.hejazi@yahoo.com)
Department:	Department of Civil Engineering

Course Title:	Smart Cities and Zero Energy Buildings
Duration:	2 hours (1 session of 2 hours)
Lectures titles:	1. Smart City 2. Smart Building 3. Zero Energy Building 4. Case Studies
References	Abu-Rayash, A. (2024). <i>Smart city assessment: A novel framework for development and evaluation of smart cities</i> . Elsevier. New York. Zuo, J., & Zhao, Z.-Y. (2014). <i>The zero energy building: A design guide</i> . Routledge. New York.
Prerequisite:	Adequate knowledge of architectural heritage restoration
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Mehrdad Hejazi (Email: m.hejazi@eng.ui.ac.ir & mm.hejazi@yahoo.com)
Department:	Department of Civil Engineering

Course Title:	Construction Management
Duration:	48 hours (16 sessions of 3 hours) Note: The duration of this course can be adjusted for shorter courses as follows: • 32 hours (16 sessions of 2 hours each, with reduced content for each 'Item' in the 'Lecture Titles' section) • 16 hours (8 sessions of 2 hours each, with selected and reduced content for each 'Item' in the 'Lecture Titles' section) • 8 hours (One day workshop or 4 sessions of 2 hours each, with selected contents)
Lectures titles:	1. Characteristics of a construction project; Project implementation stages 2. Introduction to PMBOK standard; Project management stages 3. Discussion on the different stages of a project, planning stages 4. Discussion on the different stages of a project, monitoring and control stages 5. Integration management; Scope management; WBS 6. Time management; Creating a project network 7. Estimating the duration of activities; Delphi method 8. Network time analysis; CPM; Gantt chart 9. Review of MSP software and its capabilities – Examples 10. Cost management; Project financial indexes and parameters 11. Time-cost balance models; Project quality management 12. Project resource management; Allocating limited and unlimited resources 13. Program evaluation and review technique (PERT) method 14. Graphical evaluation and review technique (GERT) method 15. Types of contracts (use cases, characteristics, advantages and disadvantages) 16. Introduction to Risk project management
Prerequisite:	Basic knowledge of civil engineering project
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Mehran Zeynalian (Email: m.zeynalian@eng.ui.ac.ir & mehran_zeynalian@yahoo.com)
Department:	Department of Civil Engineering

Course Title:	Cold Formed Steel Structures
Duration:	48 hours (16 sessions of 3 hours) Note: The duration of this course can be adjusted for shorter courses as follows: • 32 hours (16 sessions of 2 hours each, with reduced content for each 'Item' in the 'Lecture Titles' section) • 16 hours (8 sessions of 2 hours each, with selected and reduced content for each 'Item' in the 'Lecture Titles' section) • 8 hours (One day workshop or 4 sessions of 2 hours each, with selected contents) • 4 hours (Half Day workshop or 2 sessions of 2 hours each, with selected contents)
Lectures titles:	1. Introduction, advantages and disadvantages of cold formed steel (CFS) structures 2. Construction styles of CFS buildings 3. Mechanical properties of CFS sections, residual stress, imperfections 4. Local buckling in CFS sections 5. Distortional and global buckling in CFS elements 6. Introducing available codes and standards on CFS structures worldwide; different approach to design CFS structures 7. Design of CFS Elements – Tension and compression 8. Design of CFS Elements – Bending 9. Design of CFS Elements – Shear 10. Design of CFS Elements – Torsion 11. Design of lateral resistant systems for CFS structures 12. Screwed connection design 13. Riveted connection design 14. Welded connection design 15. Technical issues of CFS structures (design and construction) 16. Introducing some available software related to CFS structures
Prerequisite:	Structural Analysis I, Steel Structures I & II
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Mehran Zeynalian (Email: m.zeynalian@eng.ui.ac.ir) & mehran_zeynalian@yahoo.com)
Department:	Department of Civil Engineering

Course Title:	Surface Water Quality Management: Principles and New Approaches
Duration:	32 hours (16 sessions of 2 hours)
Lectures titles:	1. An introduction to the pollutants and polluters of surface water resources (8 hours) 2. Principles of pollution transport and modeling in rivers and estuaries (8 hours) 2. Principles of water and wastewater treatment processes (8 hours) 3. Challenges and approaches in surface water quality monitoring (8 hours) 5. Project
Prerequisite:	-
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Shervin Jamshidi (Email: sh.jamshidi@eng.ui.ac.ir & jamshidi.ui@gmail.com)
Department:	Department of Civil Engineering

Course Title:	Sustainability and System Thinking in Water Resources
Duration:	8 hours (4 sessions of 2 hours)
Lectures titles:	1. An introduction to sustainability and its application in water resources (2 hours) 2. Principles and approaches in water allocation policies (2 hours) 2. Principles of water governance and its definitions (2 hours) 3. System thinking in water resource management (2 hours) 5. Project
Prerequisite:	-
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Shervin Jamshidi (Email: sh.jamshidi@eng.ui.ac.ir & jamshidi.ui@gmail.com)
Department:	Department of Civil Engineering

A.1.2. Department of Geomatics Engineering

Course Title:	Animal Movement Data Analysis with R
Duration:	12 hours (6 sessions of 2 hours)
Lectures titles:	1. Basic movement statistics computation 2. Statistical Hypothesis Testing on Movement Trajectories 3. Spatial Analysis and Remote Sensing Integration of Movement Trajectories 4. Movement Visualization and Animation 5. Home range analyses (MCP, CHP, AKDE, Continuous Time Models, ...) 6. Habitat Selection: Resource Selection Functions (RSFs) and Step Selection Functions (SSFs) 7. Trajectory Segmentation and Behavioral Estimation (BCPA, Multi-State Correlated Random Walk, Hidden Markov Chain, ...) 8. Fitting multi-migration range shift models to migratory animals movement prediction
Prerequisite:	An introductory probability and statistics course, An introductory GIS course
Reference:	Hooten, M. B., Johnson, D. S., McClintock, B. T., & Morales, J. M. (2017). <i>Animal movement: statistical models for telemetry data</i>. CRC press. Cheraghi, F., Delavar, M. R., Amiraslani, F., Alavipanah, K., Gurarie, E., Jowkar, H., ... & Fagan, W. F. (2019). Inter-dependent movements of Asiatic Cheetahs <i>Acinonyx jubatus venaticus</i> and a Persian Leopard <i>Panthera pardus saxicolor</i> in a desert environment in Iran (Mammalia: Felidae). <i>Zoology in the Middle East</i>, 65(4), 283-292. Cheraghi, F., Delavar, M. R., Amiraslani, F., Alavipanah, S. K., Gurarie, E., & Fagan, W. F. (2018). Statistical analysis of Asiatic cheetah movement and its spatio-temporal drivers. <i>Journal of arid environments</i>, 151, 141-145. Chicago
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Farid Cheraghi (Email: f.cheraghi@cet.ui.ac.ir & faridcher@gmail.com)
Department:	Department of Geomatics Engineering

Course Title:	Geospatial Information Systems Lab with QGIS, SAGA, GRASS and Python
Duration:	16 hours (8 sessions of 2 hours)
Lectures titles:	1. Introduction to various free/commercial GIS software 2. Introduction to the QGIS GUI, modules' capabilities and different types of attribute, spatial and mixed queries 3. An explanation fo layers, map canvas, and the method of adding layers to map 4. Vector layer creation in various formats like Geopackage, Spatialite, Shapefile, etc.; Vector layer digitization in GIS; Performing data prepration steps like identification of attribute and topological errors; coordinate reference system and map projection definition and reprojection 5. Attribute data entry including: adding a field to a layer's attribute table; import data from Excel to QGIS and attribute join of two tables 6. Raster layer creation including various spatial interpolation methods, especially DEM generation 7. Various basic vector analyses methods including extract, proximity, overlay, spatial statistics class of methods and network analysis; raster analyses methods including distance, slope, aspect, hill shade, viewshed, visibility, reclassification and map algebra. 8. Network analyses like routing, least-cost path analysis, service area, etc. 9. Site selection, center line extraction, etc. 10. Chaining processing tools with model builder
Prerequisite:	An introductory course in GIS
Reference:	QGIS Training Manual , QGIS Project Online Documentation Lawhead J., (2017). QGIS Python Programming Cookbook, Packt Publishing Ltd.
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Farid Cheraghi (Email: f.cheraghi@cet.ui.ac.ir & faridcher@gmail.com)
Department:	Department of Geomatics Engineering

Course Title:	Spatial Data Analysis with R
Duration:	16 hours (8 sessions of 2 hours)
Lectures titles:	1. Geographic Data: Properties, Strengths, and Analytical Challenges 2. Concepts of Scale, Spatial Dependency, Spatial Proximity; Modifiable Areal Unit Problem (MAUP) 3. Concept of Spatial Autocorrelation 4. Scale of Measurements (Nominal, Ordinal, Ratio, Interval) 5. Spatial Sampling (Random, Sequential and Stratified) 6. Analyze Data Distributions: (Spatial) Measures of Central Tendency and Dispersion, 7. Random Variables and Probability Distributions (Normal, Binomial and Poisson) 8. Exploratory Data Analysis and Visualization: Scatterplot, Boxplot, PCP plot, Scatterplot Matrix 9. Hypothesis Testing, Confidence Interval and p-Values: Student's t-test, Chi-square test 10. Spatial Statistical Relationships: Correlation Analysis, Ordinary Least Squares, Geographically Weighted Regression, Variance Inflation Factor 11. Point Pattern Analysis: Quadrat Count, Nearest Neighbour, K-Function, Kernel Estimation 12. Areal Pattern Analysis: Global/Local Moran's I, Geary's C and Getis-Ord G Coefficient of Autocorrelation 13. Geostatistics and Krigging: Simple, Ordinary, Indicator and Conditional Krigging
Prerequisite:	An introductory probability and statistics course, An introductory GIS course
Reference:	Oyana, Tony J. and Margai, Florence M. 2016. Spatial Computational Methods, CRC Press Taylor & Francis Group <u>O'Sullivan, D. and Unwin, D. 2010, Geographic Information Analysis, J Wiley, New Jersey</u> <u>Smith, M.J. de, Goodchild, M.F. and Longley, P. A. 2007. Geospatial Analysis, A comprehensive Guide to Principles, Techniques and Software Tools, Matador, Leicester, UK</u>
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Farid Cheraghi (Email: f.cheraghi@cet.ui.ac.ir & faridcher@gmail.com)
Department:	Department of Geomatics Engineering

Course Title:	Crop Mapping Using Remote Sensing & Geospatial Information System
Duration:	4 hours (4 sessions of 1 hour)
Lectures titles:	1. Land-cover/land-use (LCLU) concept 2. Mapping concept 3. Crop mapping concept 4. Traditional methods/RS&GIS for crop mapping 5. Data sets for crop mapping: Optical satellites data, Radar satellites data, Auxiliary data 6. Multi-temporal/Time series 7. Crop mapping algorithms 8. Collecting samples for crop mapping 9. An operational crop mapping procedure
Prerequisite:	An introductory course in remote sensing
Reference:	Campbell, J. B., & Wynne, R. H. (2011). Introduction to remote sensing. Guilford press. Richards, J. A., & Richards, J. A. (2022). Remote sensing digital image analysis (Vol. 5, pp. 256-258). Berlin/Heidelberg, Germany: springer.
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Iman Khosravi (Email: i.khosravi@cet.ui.ac.ir & iman.khosravi@ut.ac.ir)
Department:	Department of Geomatics Engineering

Course Title:	Remote Sensing Techniques for Soil Moisture Assessment
Duration:	16 hours (8 sessions of 2 hours)
Lectures titles:	1. The Importance of Soil Moisture: Application Fields and Examples 2. Spatio-Temporal Dynamics of Soil Moisture: Ground-Based Measurement Limitations and the Critical Role of Remote Sensing—Challenges and Solutions 3. The Role of Optical Remote Sensing in Soil Moisture Retrieval 4. The Role of Microwave Remote Sensing in Soil Moisture Retrieval 5. Modeling the Impact of Surface Roughness and Vegetation Cover on Soil Moisture Retrieval 6. Innovative Algorithms for Soil Moisture Retrieval Using Passive Microwave Remote Sensing 7. Integrating Remote Sensing with Ground Truth Data for Soil Moisture Modeling: Calibration and Validation Techniques 8. Innovative Algorithms Shaping the Future of Soil Moisture Retrieval from Remote Sensing Data
Prerequisite:	An introductory course in Remote Sensing
Reference:	Srivastava P.K., Petropoulos G.P., Kerr, Y.H., (2016), Satellite Soil Moisture Retrieval: Algorithms and Applications, Elsevier, edited by S. R. A. M.
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Mina Moradizadeh (Email: m.moradizadeh@eng.ui.ac.irm & mina_moradizadeh@yahoo.com)
Department:	Department of Geomatics Engineering

A.1.3. Department of Railway Engineering and Transportation Planning

Course Title:	Dynamic Modeling and Simulation of Electrical Machines Using Matlab/Simulink
Duration:	10 hours (5 sessions of 2 hours) Note: The duration of this course can be adjusted for shorter courses
Lectures titles:	1. Introduction of Modeling and Simulation with Matlab/Simulink 2. Modeling and Simulation of Transformers 3. Introduction of Transformations in Electrical Engineering 4. Modeling and Simulation of Three-phase Induction Machines 5. Modeling and Simulation of Three-phase Synchronous Machines
References	Chee-Mun Ong, (1998). <i>Dynamic simulation of electric machinery</i> . Printice Hall Company.
Prerequisite:	Basic concepts of electrical machines and electric circuits
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Pegah Hamedani (Email: p.hamedani@eng.ui.ac.ir)
Department:	Department of Railway Engineering and Transportation Planning

Course Title:	Predictive Control of Modern Power Electronic Converters
Duration:	8 hours (4 sessions of 2 hours) Note: The duration of this course can be adjusted for shorter courses
Lectures titles:	1. Introduction of Model Predictive Control 2. Predictive Control of a Three-Phase two-level Inverter 3. Predictive Control of Three-Phase Multi-level Inverters 4. Predictive Control of a Matrix Converter 5. Predictive Control of Induction Machines 6. Predictive Control of Permanent Magnet Synchronous Motors
References	Jose Rodriguez and Patricio Cortes, (2012). <i>Predictive Control of Power Converters and Electrical Drives</i> . Wiley IEEE.
Prerequisite:	Basic concepts of power electronic converters and electrical motor drives
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Pegah Hamedani (Email: p.hamedani@eng.ui.ac.ir)
Department:	Department of Railway Engineering and Transportation Planning

Course Title:	Railway Capacity
Duration:	8 hours (4 sessions of 2 hours) Note: The duration of this course can be adjusted for shorter courses
Lectures titles:	1. Railway Capacity Concepts 2. Time Headway Calculation 3. Railway Track Capacity 4. Railway Station Capacity 5. Railway Network Capacity
References	<i>UIC 405 Leaflet</i> <i>UIC 406 Leaflet, 2013</i> Selected Papers Hansen, Ingo A., and Jörn Pachl, <i>Railway Timetabling & Operations: Analysis, Modelling, Optimization, Simulation, Performance Evaluation</i> (2014).
Prerequisite:	Basic concepts of railway operations
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Nariman Nikoo (Email: n.nikoo@cet.ui.ac.ir)
Department:	Department of Railway Engineering and Transportation Planning

Course Title:	Transportation Network Modeling
Duration:	8 hours (4 sessions of 2 hours) Note: The duration of this course can be adjusted for shorter courses
Lectures titles:	1. Network Modeling Application in Transportation 2. Network Flow Models 3. Network Design Problem 4. Shortest Path Algorithms 5. Spanning Tree 6. Multi Commodity Network Flow Algorithms 7. Traveling Salesman Problem 8. Railway Network Applications
References	Bazaraa MS, Jarvis JJ, Sherali HD. <i>Linear programming and network flows</i> . John Wiley & Sons; 2008 Nov 4. Waissi, G. R. (1994). <i>Network flows: Theory, algorithms, and applications</i> . Selected papers
Prerequisite:	Operation Research
Language prerequisite:	English proficiency at a minimum B2 level
Lecturer:	Dr. Nariman Nikoo (Email: n.nikoo@cet.ui.ac.ir)
Department:	Department of Railway Engineering and Transportation Planning