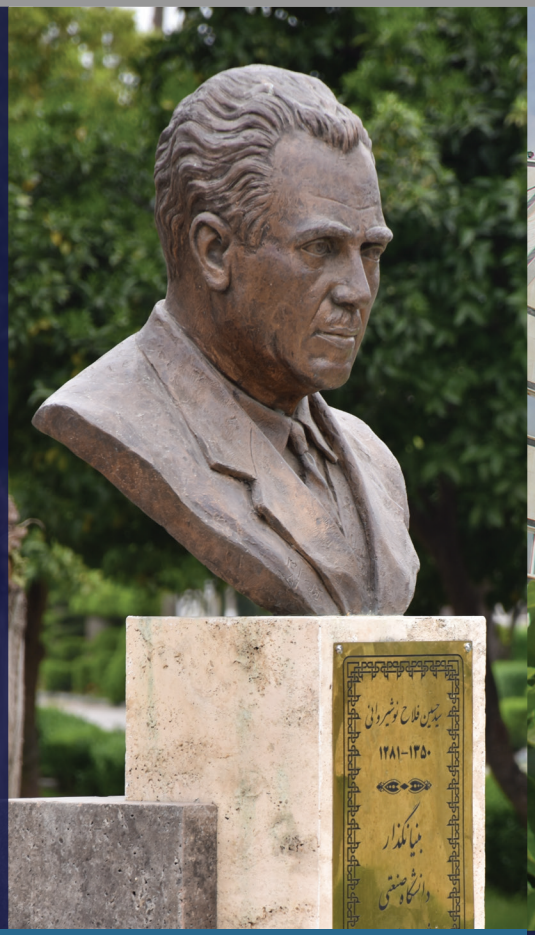
ABOUT US

The Babol Noshirvani University of Technology, sometimes also referred to as Noshirvani Institute of Technology or NIT, is a public research university and institute of technology located in Babol, Mazandaran Province in the north of Iran. The school was founded in 1970 by the Iranian philanthropist, Seyed Hossein Fallah Noshirvani.

Today, BNUT is home to nearly 200 faculty members and 6000 undergraduate and graduate students, and is organized into six faculties, all of which emphasize on science and technology.

BNUT is an influential center for academic research in Iran, due to which it has been consistently ranked among the top schools in the country. BNUT is currently ranked 1st among all Iranian universities according to Times Higher Education (THE) World University Rankings.



GET IN TOUCH

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THE WORLD UNIVERSITY RANKINGS 2019 — 1st in IRAN

THE WORLD UNIVERSITY RANKINGS YOUNG 2018 — 55th in the World

BEST GLOBAL UNIVERSITIES U.S.News 2019 — 231st in Engineering

ISC Islamic World Science Citation Center — 5th among Iranian Universities of Technology

BNUT SUMMER SCHOOL 2019

BABOL NOSHIRVANI
UNIVERSITY OF TECHNOLOGY

WWW.NIT.AC.IR

Welcome to BNUT Summer School 2019

As the leading institute of technology in the north of Iran and one of the most prestigious universities of the region, the Babol Noshirvani University of Technology is proud to launch BNUT Summer School 2019, a comprehensive summer school program for faculty members, students, and researchers in a wide variety of engineering topics.

BNUT Summer School 2019 is a unique opportunity for students and faculty members to get introduced to research and engineering topics of interest by our distinguished faculty members, many of whom are world-renowned researchers in their fields. In our summer school, the faculty members will combine classroom instruction with hands-on experience to get the most out of 3- or 4-day training periods. The participants will also have the opportunity to go on a sightseeing tour in Mazandaran and visit some of the most spectacular natural attraction sites of Iran.

How to Register:

- Registration is open to students, staff and faculty members as well as professionals.
- To register for Summer School 2019 at BNUT, please contact the Office of Scientific Collaborations and International Affairs via email. In your email please provide the following information:
  - Name and contact information for the applicant.
  - Selected course/s.
  - Any special accommodation needs.

Registrations fees will be received in person on the first day of each course.

- Visa

The Office of Scientific Collaborations and International Affairs will assist the applicants with the visa application process, which is completed online. The visa process normally takes 4 weeks.

Important Dates:

- Registration Deadline:
July 6, 2019

- Courses:
August 17 - 19, 2019
August 24 - 27, 2019

- Registration Fees*:
- 3-day courses: $500
- 4-day courses: $600

* Registration fees include the cost of courses plus accommodation, launch and one full day sightseeing tour.
** Premium accommodation at Mizban Hotel is available at discounted fees. Please contact the Office of Scientific Collaborations and International Affairs for additional information.

Phone: +98 11 32310973
Email: international@nit.ac.ir

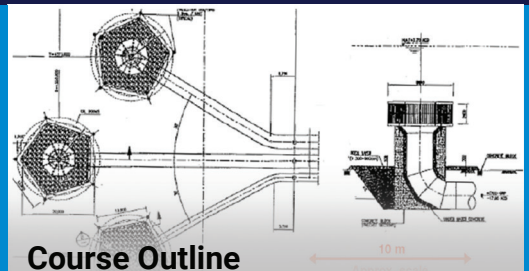
DEPARTMENT OF CIVIL ENGINEERING

WASTEWATER DISCHARGE INTO THE MARINE ENVIRONMENT, DESALINATION BRINE DISPOSAL AND SEA WATER INTAKES

About this course

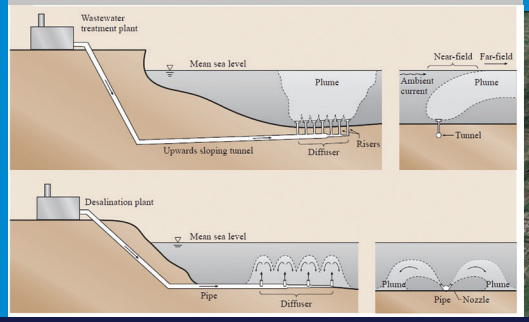
Today 60% of the world's population lives in the coastal areas. Because of the expansion in international trade, natural attraction and population growth in coastal cities, this ratio increases each year. In many cases, the produced wastewater in coastal areas needs to be discharged back to the environment (river, sea) from the perspective of its economic and environmental priority compare to the other methods. If adequately diluted in the receiving water, wastewater (domestic sewage, brine or thermal effluent) can be safely discharged back to the environment. Efficient mixing of flow can be obtained by marine outfall. The dilution that results can rapidly reduce concentrations of toxic materials contained in the effluent to a safe level. When discharging flow into ambient water, hydrodynamically two regions can be considered near to the source (Near-field and Farfield). In this course, the process of mixing and entrainment and computer modeling of flow disposal will be explained. Some of the essential issues involved in the management and modeling of desalination brine discharge for the coastal desalination plants will be discussed. Seawater intake and the standards to design these systems will be discussed.

Also through a day in Three-dimensional laser induced fluorescence (3DLIF) laboratory, the experimental method commondly used in this topic will be explained. Workshops will be held on 4 days and 8 sections.



Course Outline

1. Marine outfall for wastewater disposal: applications, capabilities and limitations
2. Coastal desalination brine: Characteristics, standards, and disposal methods
3. Physical Mixing process and Mixing Zone Analysis
4. Modeling and simulation approaches (experimental, integral and numerical methods)
5. Mixing theory, Turbulence and CFD Techniques for outfall design a
6. Modeling, Design Scheme and de facto standards
7. Introduction to Sea water intakes, capabilities and limitations
8. Modeling and standards for design in deep intakes



Instructor

Ozeair Abessi, Ph.D.
Assistant Professor
Department of Civil Engineering

Duration: 4 days
(August 24 - 27)
Sightseeing tour: August 28

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URBAN PLANNING FOR THE FUTURE'S ECO-CITIES AND GREEN BUILDINGS

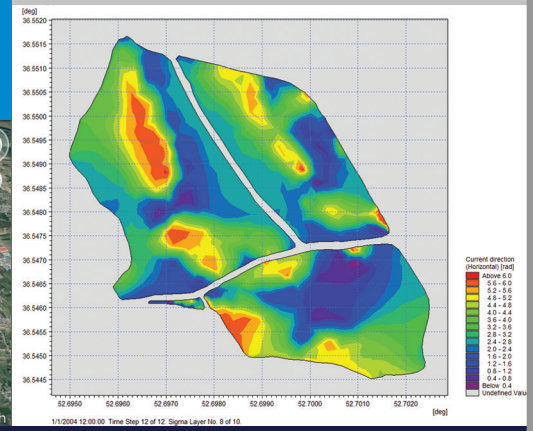
About this course

Green building is looking for a process in which building construction is compatible with the environment and conservation of resources during its lifetime. The concept of preliminary engineering design for sustainable construction seems to perfectly match this idea. This is in line with the concept of future eco-cities in which ecological prospects have been considered for the planning and management of the cities. Eco and Green cities are new approaches for planning and developing future cities. There are good experiences in the region to see how they all can align in the same trend with our technological progress.

In this course, the modern concept of eco-friendly living in our cities considering the regional potential for development and progress with a good example of noshirvani university engagement in a city eco-friendly program will be presented. A field visit of Babol wetland, Golenilofar Talab, is planned and its role for the enhancement of surface water quality will be discussed presenting the developed computer model.

Course Outline

1. Modern technology of spatial analysis in future cities planning and management
2. Rivers and Wetlands' role in eco-cities
3. Wetlands: Earth's Kidneys, Ecological function modeling, and implementation
4. Green building: indoor and outdoor air flow modeling
5. Novel eco-friendly buildings (green facades, wall and balcony gardens and etc)
6. Natural ventilation based on biomimetic designs (mound lungs ventilation system, the prairie dog burrows and wind catcher)
7. he ecological footprint of buildings construction and operation in different



Instructor

Ozeair Abessi, Ph.D.
Assistant Professor
Department of Civil Engineering

Duration: 3 days
(August 17 - 19)
Sightseeing tour: August 20

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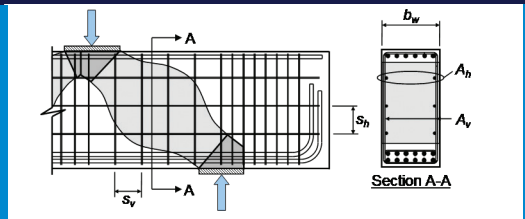
DESIGN OF REINFORCED CONCRETE STRUCTURES USING STRUT-AND-TIE MODELS

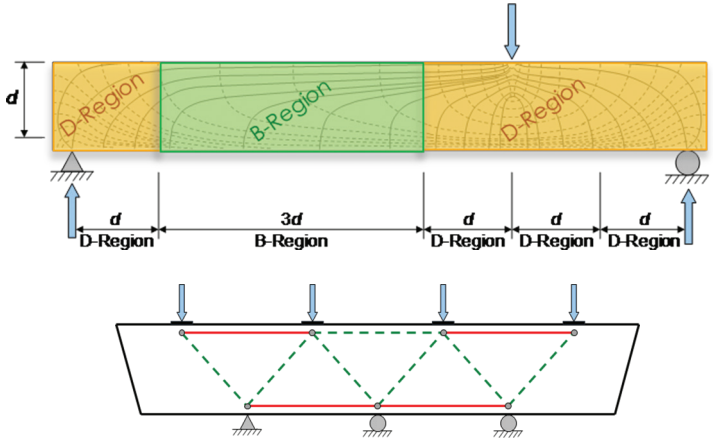
About this course

Strut-and Tie Method (STM) is a flexible tool for designing the disturbed (or D-) regions of reinforced concrete members, in which the strain profile is highly nonlinear and the assumption that "plane sections remain plane" is not valid. STM has recently become a part of the main body of major design codes such as ACI 318 (since 2014). However, most structural engineers are not familiar with this valuable design methodology, which is critical for designing the end-regions of reinforced concrete elements, deep beams, and members with irregular geometries and loading configurations. The objective of this course is to make the audience familiar with the strut-and-tie method using practical examples for detailing of complex geometries occurring in buildings and bridges.



Course Outline

1. Detailing in reinforced concrete: empirical methods vs. Strut-and-Tie Method (STM)
2. History, significance, and applications of STM
3. Components of STM
4. Design procedure according to STM
5. STM according to ACI 318-14 and AASHTO LRFD 2017 Specifications
6. Examples of Design Applications



Instructor

Hossein Yousefpour, Ph.D.
Assistant Professor
Department of Civil Engineering

Duration: 4 days (August 24 - 27)

Sightseeing tour: August 28

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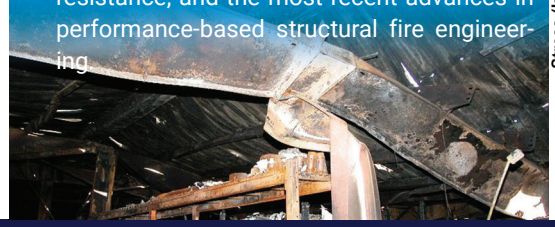
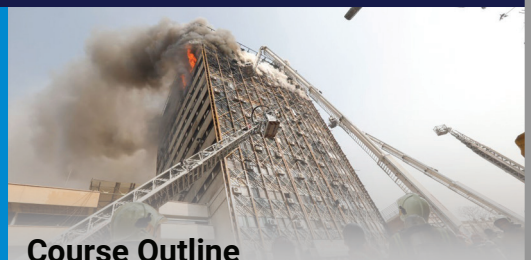
STRUCTURAL DESIGN FOR FIRE SAFETY

About this course

Understanding the behavior of structures at elevated temperatures that occur during fire is of critical importance to the structural engineering community. Traditionally, buildings have been protected against fire through a prescriptive, i.e. fire rating, approach, which results in little or no involvement by the structural engineers. However, a true understanding of the structural behavior at elevated temperatures provides significant flexibility in fire protection approaches and helps with designing retrofitting plans to prevent building collapse at the time of fire, notable examples of which include the World Trade Center, the faculty of architecture building at TU Delft, and Plasco building in Tehran.

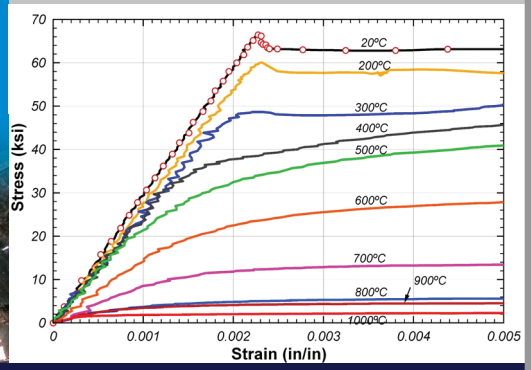
The objective of this course is to give the students an overview of the state-of-the art methodologies for designing structures, especially buildings, against fire. The topics discussed in the course include the fundamentals of heat-transfer analysis, material behavior at elevated temperatures, traditional (prescriptive) methods for providing fire resistance, and the most recent advances in performance-based structural fire engineering.





Course Outline

1. Introduction to Structural Fire Engineering
2. Fundamentals of Heat Transfer
3. Characterizing Fires
4. Heat-Transfer Calculations for Structural Fire Problems
5. Material Properties at Elevated Temperatures
6. Fire Protection Materials
7. Structural Fire Resistance: Conventional Code Approaches
8. Structural Response to Elevated Temperatures: Engineered and Performance-Based Approaches



Instructor

Hossein Yousefpour, Ph.D.
Assistant Professor
Department of Civil Engineering

Duration: 3 days (August 17 - 19)

Sightseeing tour: August 20

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3D PHOTOGRAMMETRIC AND LIDAR POINT CLOUD PROCESSING

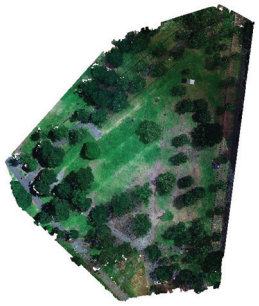
About this course

A 3D point cloud comprises a set of a large number (millions) of points with X, Y, Z information. 3D Point clouds derived from photogrammetry or LiDAR sources have been widely used for many applications such as 3D mapping and modelling, disaster management, rural and urban design, forest and urban tree canopy mapping, agriculture and environmental management, etc. The use of point clouds offers a fast and accurate mapping with reasonable cost. The point cloud processing includes noise removal, point cloud alignment, point cloud segmentation and classification. The process of point clouds requires a background of 3D data collections such as photogrammetry and LiDAR, and the ability to use related software packages.

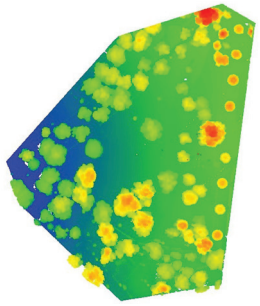
Course Outline

1. Introduction to 3D point cloud data structure and formats
2. Photogrammetric point cloud
3. LiDAR point cloud
4. Comparison of the point clouds in terms of accuracy and completeness
5. Software for point cloud processing
6. Processing of real point cloud data sets

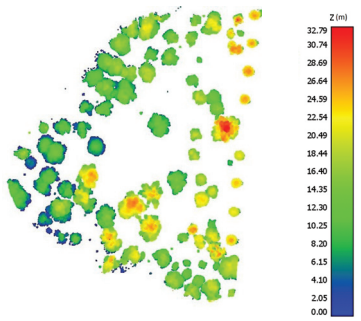
* The objective of this course is to introduce the point cloud data processing techniques using practical examples and real data sets.



Photogrammetric point cloud



LiDAR point cloud



Urban tree canopy map

Instructor

Ebadat Ghanbari Parmehr, Ph.D.
Assistant Professor
Department of Civil Engineering

Duration: 3 days
(August 17 - 19)
Sightseeing tour: August 20

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UAV PHOTOGRAMMETRY AND MAPPING

About this course

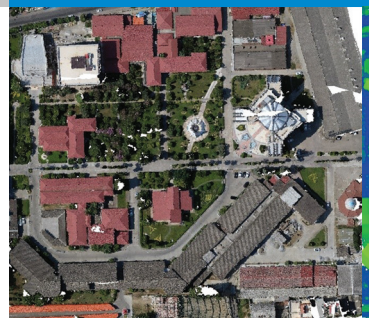
Unmanned aerial vehicles (UAVs) photogrammetry are widely used for 3D mapping for many applications It offers a wide range of products such as 3D point cloud, 3D model, DSM, DEM, orthoimage, topographic maps and virtual realistic models.

A UAV photogrammetry project includes two steps: data collection and data processing. Data collection includes flight mission design and capturing images as well as measuring coordinates of ground control points. The UAV image processing requires the basic knowledge of the photogrammetric technique data processing and familiarity with UAV data processing software.

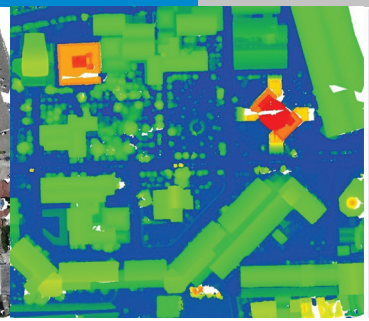
The objective of this course is to introduce the UAV image processing techniques for 3D mapping along with practical experience of working with professional software.

Course Outline

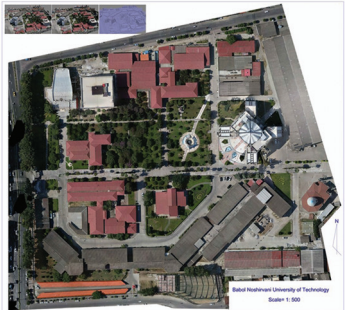
1. Introduction to UAV photogrammetry
2. Design of UAV flight mission and data collection
3. Introduction to photogrammetric software
4. Process of the collected UAV data
5. Camera calibration and quality control
6. Edit and export the produced topographic maps



Photogrammetric point cloud



LiDAR point cloud



Urban tree canopy map

Instructor

Ebadat Ghanbari Parmehr, Ph.D.
Assistant Professor
Department of Civil Engineering

Duration: 3 days
(August 25 - 27)
Sightseeing tour: August 28

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MODERN SEISMIC RETROFIT OF EXISTING STRUCTURES AND BRIDGES

About this course

Nowadays, earthquake-resistant design of buildings and other constructions is gaining worldwide attention due to enormous damaging potential of earthquakes. Newly developed design and analysis tools as well as recently-proposed innovative construction and protection technologies can help structures survive under large earthquakes. Globalized working environment, where any professional can be involved with constructions in seismic regions requires the engineers to be familiar with recent approaches and retrofitting methods.

This course intends to provide the attendees with the up-to-date information and background on seismic vulnerabilities assessment procedures, strengthening or retrofitting strategies and techniques for buildings.

At the end of this course, attendees should be able to understand the buildings and bridges seismic assessment procedures. Also will be able to use self-programmed software packages for efficient seismic analysis and design of FRP retrofitted concrete beams and columns for buildings and bridges and evaluate them by experimental test results which will be carried out at the end of the course.

Course Outline

1. History of Earthquake Engineering and Performance-Based Seismic Design
2. Basic Concepts of Seismic Evaluation
3. Seismic Evaluation and Retrofit of Steel Moment Frame Buildings
4. Seismic Evaluation and Retrofit of Steel Braced Frame Buildings
5. Seismic Evaluation and Retrofit of Reinforced Concrete Moment Frame Buildings
6. Seismic Evaluation and Retrofit of Foundation Systems
7. Seismic Evaluation and Retrofit of Nonstructural Components
8. FRP retrofit analysis and design procedure.
9. Evaluate the existing FRP retrofitted beam and experimental test in lab

Instructor

S. Komeil Hashemi, Ph.D.
Assistant Professor
Department of Civil Engineering

Duration: 4 days
(August 24 - 27)
Sightseeing tour: August 28

DEPARTMENT OF CHEMICAL ENGINEERING

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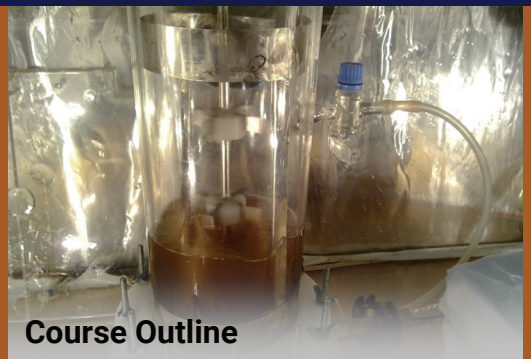
TECHNIQUES OF IMMOBILIZATION FOR ICR BIOREACTORS

About this course

The objective of this course is to provide hands-on experience with different techniques of immobilization for ICR bioreactors. Production of ethanol, Citric acid by from industrial using waste using immobilized and submerged bioreactors by Microorganisms such as Kluyveromyces marxianus and Aspergillus niger investigation of the kinetic parameters will be conducted. Fermentation of industrial waste to ethanol using immobilized Kluyveromyces marxianus cells is also investigated in batch and continuous operation. The effect of substrate (lactose) and product (citric acid) concentrations, medium pH, sesame oil on production of citric acid are studied. In addition, the cell dry weight is measured during the fermentation process. Enzyme production from industrial waste using fermenter and investigation of kinetic parameters will be carried out. Production of pectinases by Aspergillus niger is carried out through solid state fermentation.

Additionally, an extracellular pigment-producing filamentous fungi study and its optimal culture conditions are investigated. The properties of pigments and their residual content after exposure to the various physico-chemical conditions like sunlight, fluorescent light, UV light, high temperature and preservatives (sodium bisulfate, ascorbic acid and citric acid) are also investigated. Isolation of organisms via culturing on broth and plates for identifications are applied.



Course Outline

1. Fermentation of industrial waste to fine product
2. Bioreactor operation
3. Extraction process of bioactive compounds
4. Enzyme kinetics
5. Immobilization techniques in ICR
6. Bacterial culturing

Instructor

Ghasem Najafpour, Ph.D.
Professor
Department of Chemical Engineering

WWW.NIT.AC.IR

Duration: 3 days (17 - 19 August)

Sightseeing tour: August 20

MICROBIAL FUEL CELL AS NEW SOURCE OF ENERGY

About this course

It's well defined that various sources of energy are urgently required to be used instead of fossil fuels due to the pollution and many hazardous toxics generated by utilization of those non-renewable fuel sources. As a solution to this crisis, Microbial fuel cells (MFCs) have been nominated as an alternative to nonrenewable sources of energy capable of transforming organic matters directly into electrical power via anodic catalyzed reactions and electrochemical reactions done in cathode.

Course Outline

1. Introduction to Structural Fire Engineering
2. Fundamentals of Heat Transfer
3. Characterizing Fires
4. Heat-Transfer Calculations for Structural Fire Problems
5. Material Properties at Elevated Temperatures
6. Fire Protection Materials
7. Structural Fire Resistance: Conventional Code Approaches
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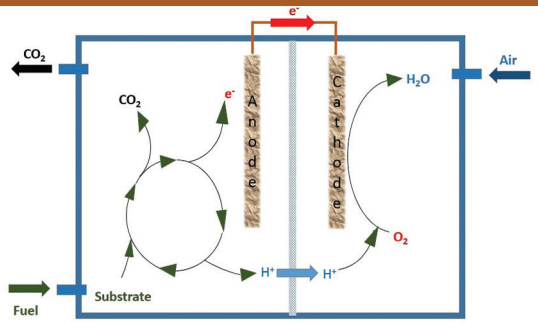

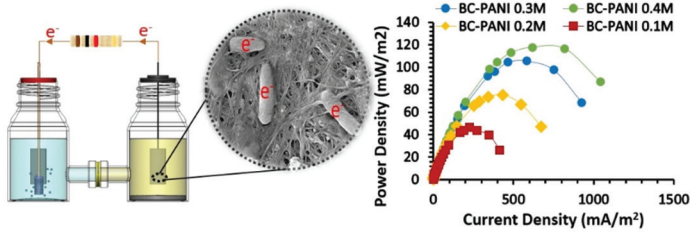

Instructor

Mostafa Rahimnejad, Ph.D.
Associate Professor
Department of Chemical Engineering

Duration: 4 days (24 - 27 August)

Sightseeing tour: August 28

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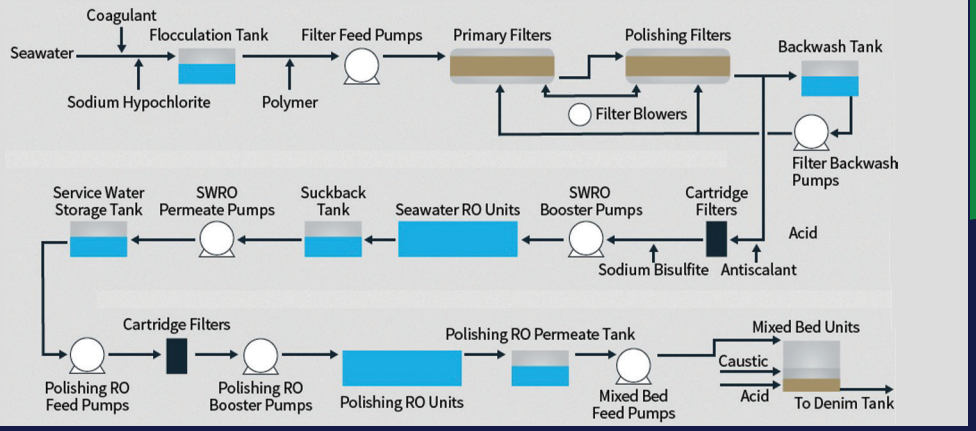
ADVANCED NANOSTRUCTURED MEMBRANE TECHNOLOGY IN ENVIRONMENT

About this course

The course topics include practical information about performance and operating conditions of reverse osmosis and nanofiltration technology for brackish and seawater desalting. The program includes introduction to membrane technology, description of commercial membrane elements, and illustration of the membrane system design process and overview of systems operation. Calculations of the investment and operating cost of membrane plants, based on design cases will be illustrated. A section of the course is dedicated to the modern microfiltration and ultrafiltration technology applied for treatment of potable water and as a pretreatment of feed water for RO systems. Course material also includes information on process and equipment applied in membrane bioreactor (MBR) systems.

Course Outline

1. Fundamentals of membrane desalination processes
2. Membrane performance
3. Water chemistry of the desalination process
4. Post treatment
5. Energy usage in desalination systems
6. Pretreatment process configuration
7. Pretreatment process design



DEPARTMENT OF MECHANICAL ENGINEERING

Instructor

Majid Peyravi, Ph.D.
Associate Professor
Department of Chemical Engineering
WWW.NIT.AC.IR

Duration: 3 days
(August 17 - 19)
Sightseeing tour: August 20

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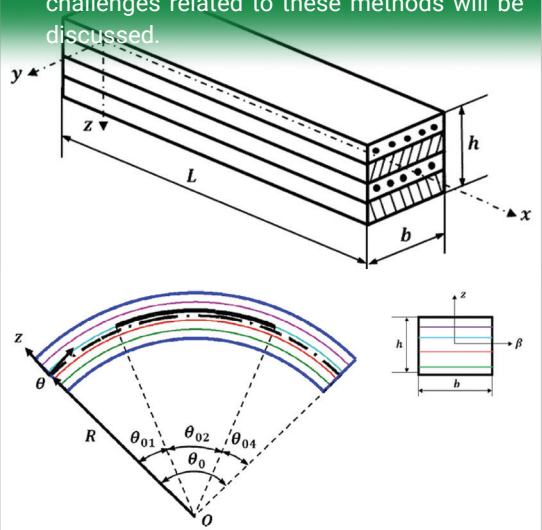
APPLYING THE ENERGY METHODS IN STATIC AND DYNAMIC ANALYSIS OF THE STRUCTURES

About this course

One of the most important method in the analysis of any type of structure is the famous Energy Method. In this workshop, the basic concepts along with the general steps for applying this method will be taught. Ritz method and Ritz method combined with Lagrange multipliers for the static analysis and also Rayleigh-Ritz method and Rayleigh-Ritz method combined with Lagrange multipliers for the dynamic analysis will be discussed in detail. These methods will be applied for different one and two dimensional problems. In order to apply the above mentioned methods efficiently, the MATLAB software will be used. At the end, some open problems and also some challenges related to these methods will be discussed.



Course Outline

First Day (6 Hours):
- An Introduction to the Calculus of Variations
- Free and Constrained Variational Problems
- Some Points about the Boundary Conditions

Second Day (6 Hours):
- Variational Principles in Static Analysis of the Structure (1-Dimensional Analysis)
- Static Analysis: Ritz Method
- Static Analysis: Ritz Method Combined with Lagrange Multipliers
- An Introduction to the MATLAB Software
- Applying "Ritz Method" and "Ritz Method Combined with Lagrange Multipliers" Using MATLAB Software

Third Day (6 Hours):
- Variational Principles in Free Vibrational Analysis of the Structure (1-Dimensional Analysis)
- Vibrational Analysis: Rayleigh-Ritz Method
- Vibrational Analysis: Rayleigh-Ritz Method Combined with Lagrange Multipliers
- Applying " Rayleigh-Ritz Method" and "Rayleigh-Ritz Method Combined with Lagrange Multipliers" Using MATLAB Software

Forth Day (6 Hours):
- Extension of the "Rayleigh-Ritz Method Combined with Lagrange Multipliers" for the 2-Dimensional Analysis
- Some Open Problems and Open Challenges Related to the Subject

Instructor

Ramazan-Ali Jafari-Talookolaei, Ph.D.
Assistant Professor
Department of Mechanical Engineering

Duration: 3 days
(August 17 - 19)
Sightseeing tour: August 20

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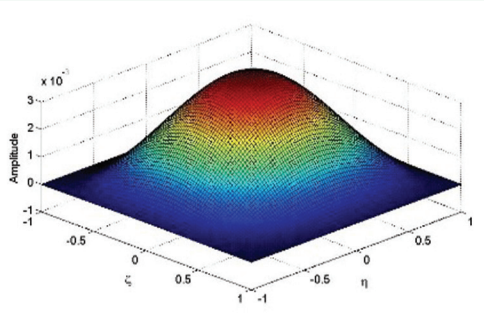
STATIC AND DYNAMIC ANALYSIS OF LAMINATED COMPOSITE BEAM/PLATES USING FINITE ELEMENT METHOD

About this course

In this workshop, the static and dynamic analysis of laminated composite beams and plates will be taught using the finite element method (FEM). The basic and fundamental concepts in FEM will be discussed. The reasons for the element type selection along with its degrees of freedom for each node will be said in detail. The audience of this workshop will learn the common methods in deriving the mass and stiffness matrices of an element and how to assemble them to obtain the total matrices. Likewise, MATLAB software is used to write the programs to obtain the solution of different problems using FEM. The obtained results will be compared against the results obtained from the commercial software ANSYS.



Course Outline

First Day (6 Hours):
- Introduction to the Finite Element Method
- Different Steps in Deriving an Element Equations and Its Solution

Second Day (6 Hours):
- Deriving the Mass and Stiffness Matrixes for the Laminated Composite beam
- Assembling the Above Mentioned Matrices and Obtaining the Total Equations of Motion in Matrix Form
- Applying the Boundary Conditions and Obtaining the Reduced Equations of Motion
- Using the MATLAB Software in One Dimensional Finite Element Method

Third Day (6 Hours):
- Deriving the Mass and Stiffness Matrixes for the Laminated Composite Plate
- Assembling the Above Mentioned Matrices and Obtaining the Total Equations of Motion in Matrix Form
- Applying the Boundary Conditions and Obtaining the Reduced Equations of Motion
- Using the MATLAB Software in Two Dimensional Finite Element Method

Forth Day (6 Hours):
- An Introduction to the ANSYS Software
- Applying ANSYS in Static and Vibrational Analysis of the Laminated Beam/Plate
- Results Comparison and Discussion

Instructor

Ramazan-Ali Jafari-Talookolaei, Ph.D.
Assistant Professor
Department of Civil Engineering

Duration: 4 days
(August 24 - 27)
Sightseeing tour: August 28

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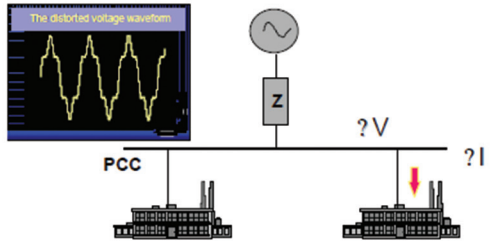
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

UNDERSTANDING POWER QUALITY PROBLEMS

About this course

In recent years equipment has been more sensitive to disturbances therefore has been an increased emphasis and concern for the quality of power delivered to factories, commercial establishments, and residences. This is due to the increasing of non linear loads. Thus understanding of power quality for electrical engineers are essential.



Course Outline

1. Interest in Power Quality
2. Overview of Power Quality Phenomena
3. Purpose of Standardization
4. Long Interruptions and Reliability Evaluation
5. Causes of Long Interruptions
6. Origin of Long Interruptions
7. Standards and Regulations
8. Costs of Interruptions
9. Short Interruptions
10. Origin of Short Interruptions
11. Monitoring of Short Interruptions
12. Influence of short iInterabtion on Equipment
13. Single-Phase Tripping
14. Voltage Sags and swell-Characterization
15. Three-Phase Unbalance

Instructor

Abdolreza Sheikholeslami, Ph.D.
Associate Professor
Department of Electrical and Computer Engineering

Duration: 4 days
(August 24 - 27)
Sightseeing tour: August 28

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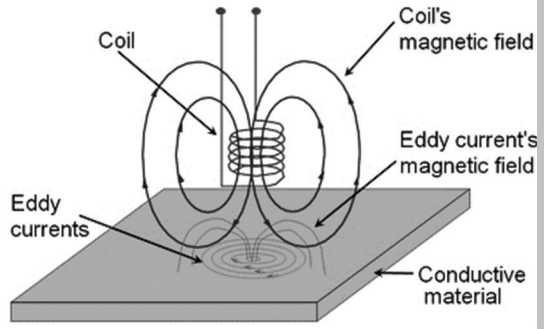
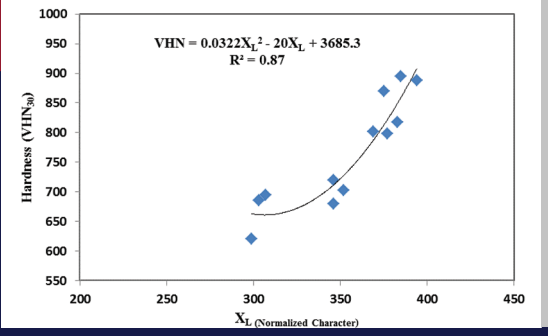
DEPARTMENT OF MATERIALS & INDUSTRIAL ENGINEERING

NONDESTRUCTIVE TESTING METHODS AND SPECIAL COURSE ON THEORY AND PRACTICE OF EDDY CURRENT TESTING (ET)

About this course

This short course is a preparatory course for personnel without prior experience in the method. The course is designed for academic researchers (PhD and MSc student or academic member) and technicians in the NDT laboratories. During this period, nondestructive testing methods are presented. Especially, the eddy current techniques are described to evaluate the soundness of metallic alloys, and microstructural and mechanical characters. A high theory and practical content is offered.





Course Outline

Day 1: Introduction to Nondestructive Testing Methods (NDT)

- NDT and Nondestructive Evaluation (NDE)
- NDT Methods (PT, MT, UT, RT, ET, and ...)
- NDT Applications
- Practical Experience using PT and MPI (overview) used for crack detection

Day 2: Fundamental of Eddy Current Testing

- Basic Principles of Eddy Currents
- Eddy Current Inspection Equipment
- Factors Affecting Eddy Currents
- Defect Detection and Evaluation
- Eddy Current Inspection Techniques
- Evaluating of Microstructure and Mechanical Properties of Alloy
- Relevant Standards

Day 3: Practical Experience using Eddy Current Testing

- Introduction of eddy current equipment (Main Unite, Probes and Test Blocks)
- Operational steps in the eddy current test and the importance of each step
- Setup of eddy current characters (setting of frequency and gains, probe selection, calibration)
- Crack Detection and Evaluation
- Microstructural evaluation of alloys
- Hardness measurement of steels and aluminum alloys
- Thickness measurement
- Introduction of some of applied researches that carried out by the eddy current method in NIT

Instructors

Majid Abbasi, Ph.D.
Associate Professor
Department of Materials and Industrial Engineering

Maryam Shamgholi
R&D Manager

Seyed Mahmoud Riazi
General Manager

Iranian Hybrid Company, Incubator Center of Technology, BNUT

Duration: 3 days (August 17 - 19)

Sightseeing tour: August 20

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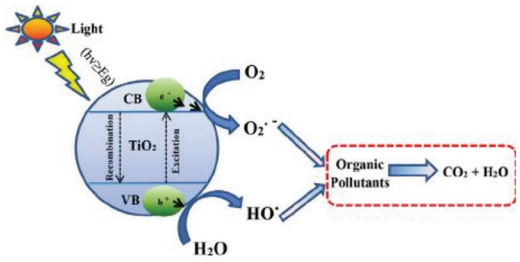
NANO-MATERIALS: SYNTHESIS OF NANOPARTICLE PHOTOCATALYSTS

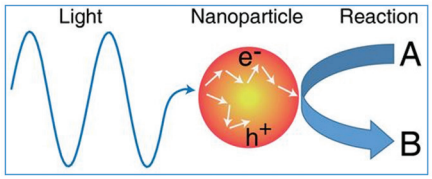
About this course

Nanoparticle photocatalysts have attracted recent interest due to their strong absorption of visible and ultraviolet light. The energy absorbed by semiconductors, makes the crucial contribution of activating the molecules on the nanoparticles which facilitates oxidation/reduction. In this course, we present here an overview of recent research on direct photocatalysis of semiconductor nanoparticles for organic pollutant degradation under light irradiation and discuss the significant reaction mechanisms that occur through light irradiation. Also, many examples of successful reactions catalyzed by semiconductor nanoparticles driven by light at ambient or moderate temperatures would be presented. The fabrication methods and introduction of application would be other sections

Course Outline

1. Arrival, Registration and Welcome Reception
2. Introduction to photocatalytic nanoparticles
3. Synthesis and Fabrication methods of photocatalysts
4. Methods of experimental tests
5. Industrial Visit (participants can choose between industrial visit and sightseeing tour)
6. Closing Session





Instructors

Reza Shidpour, Ph.D.

Assistant Professor

Department of Materials and Industrial Engineering

Duration: 3 days
(August 17 - 19)
Sightseeing tour: August 20

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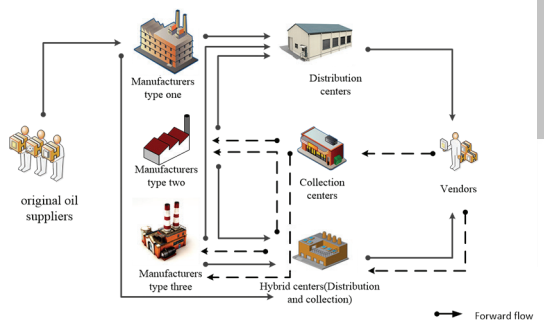
SUPPLY CHAIN MANAGEMENT

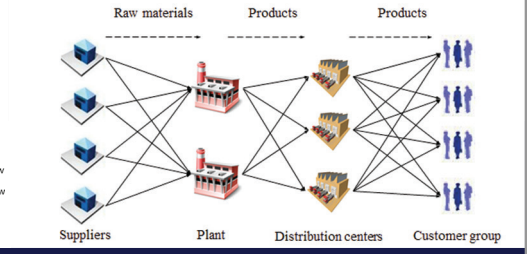
About this course

Supply Chain Management became rapidly of higher value over the last years and allows companies to stay competitive in the field of their business. Due to increasing competitive pressures, modern companies have to efficiently design the in-house and industry-wide planning and management of material, financial and information flows along the entire value creation chain. The students of this summer school will address the optimization of these processes within the supply chain as well as strategy-oriented design of value-added networks and chains, taking into consideration innovative supply chain management concepts. The goal of this Summer School is to display multiple ways to improve these logistics operations and enhance the performance of the so-called



Course Outline

1. Arrival, Registration and Welcome Reception
2. Introduction and Overview in Supply Chain
3. Supply Chain Strategies
4. Production and Inventory Planning in Supply Chain
5. Green and Sustainable Supply Chain
6. Reverse Logistics and Closed-loop Supply Chain
7. Coordination and Pricing in Supply Chain
8. Real Options in Supply Chain
9. Industrial Visit (participants can choose between industrial visit and sightseeing tour)
10. Closing Session



Instructors

Ebrahim Asadi-Gangraj, Ph.D.
Hamid Mashreghi, Ph.D.
Abdul Sattar Safaei, Ph.D.
Saeed Emami, Ph.D.
Ramezan Nemati Keshteli, Ph.D.
Mohammad Mahdi Paydar, Ph.D.
Abdollah Arasteh, Ph.D.
Ali Divsalar, Ph.D.

Duration: 4 days
(August 24 - 27)
Sightseeing tour: August 28

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