



# دورة تقنيات التصميم المغناطيسي والكهروديناميكي العهلية



## دورة تقنيات التصوير المغناطيسي والكهروميكانيكي العملية

الرجو: 36375\_27816 التاريخ: 09 - 13 Mar 2027 الموقع: دبي - Road Zayed Sheikh Marriott by Inn Residence الرسوم: Euro 6500

### Course Overview:

The course is a dynamic corporate training program designed to provide participants with both theoretical knowledge and practical skills in magnetic and electromechanical systems. This course explores topics such as magnetic design training, electromechanical design, and magnetic flux principles, offering insights into advanced areas like magnetic system circuit theory, magnetic material properties, and electromagnetic force applications. Participants will engage with subjects including magnetic actuator technologies, coil design optimization, soft and hard magnetic materials, and permanent magnet design, ensuring they gain a well-rounded understanding of the field.

### Target Audience:

- Electrical and mechanical engineers focusing on magnetic and electromechanical systems
- Research and development professionals seeking expertise in magnetic flux principles and actuator technologies
- Design engineers working on solenoid design, transformer optimization, or coil efficiency
- Product managers involved in energy conversion or electromagnetic systems
- Technicians and specialists addressing challenges in magnetic circuit design, eddy currents, or transformer leakage flux

### Targeted Organizational Departments:

- Research and development teams focused on electromechanical energy conversion and actuator technologies
- Electrical engineering departments designing solenoids, transformers, or magnetic field sensors
- Manufacturing divisions optimizing coil design and managing electromagnetic losses
- Quality assurance teams conducting BH curve analysis, measuring magnetic field properties, or reducing eddy current losses

### Targeted Industries:

- Renewable energy focusing on transformer and inductor design for solar and wind systems
- Automotive industries implementing high-speed actuators and slot motor applications
- Aerospace sectors using electromagnetic force applications and magnetic field measurement
- Consumer electronics developing compact solenoid and coil designs
- Industrial automation creating magnetic actuators and optimizing electromechanical systems

## Course Offerings:

By the end of this course, participants will be able to:

- Visualize and calculate magnetic flux principles
- Design and optimize magnetic circuits, solenoids, transformers, and inductors
- Apply magnetic actuator technologies in practical scenarios
- Understand and implement electromagnetic force applications and coil optimization techniques
- Address challenges related to magnetic material properties, eddy currents, and skin effects
- Measure and simulate magnetic fields using advanced sensors and electromagnetic simulation techniques
- Utilize Biot-Savart law and Lorentz force principles in design projects

## Training Methodology:

The course employs a blend of interactive and experiential learning methods to provide an engaging and effective training experience.

## Course Toolbox:

Participants will receive:

- A detailed course workbook covering magnetic flux principles, coil design optimization, and electromagnetic simulation techniques
- Simulation software for practicing solenoid and inductor design
- Access to online resources for advanced topics like magnetic circuit theory and actuator technologies
- Pre-configured templates and checklists for designing and analyzing electromechanical systems
- Tutorials and guides for magnetic field sensors and Biot-Savart law applications

## Course Agenda:

### Day 1: Magnetic Fundamentals and Core Principles

- Visualizing magnetic flux lines and flux paths Topic 1:
- Magnetic system circuit theory and analogies with electric circuits Topic 2:
- Properties of magnetic materials and magnetization curves B-H curves Topic 3:
- Air flux paths and leakage flux visualization techniques Topic 4:
- Parasitic inductance and capacitance in magnetic systems Topic 5:
- Key differences between DC and AC magnetic systems Topic 6:
- Discussing foundational concepts and their practical implications Reflection & Review:



## Day 2: Magnetic Forces and Actuators

- Energy and force relationships in magnetic systems Topic 1: •
- Lorentz force and its applications in electromechanical systems Topic 2: •
- Configurations of magnetic actuators and pole shaping Topic 3: •
- Design and optimization of solenoid actuators Topic 4: •
- Solenoid pull-in dynamics and motion analysis Topic 5: •
- Practical examples of gapped core and permeability effects Topic 6: •
- Analyzing case studies of actuator performance Reflection & Review: •

## Day 3: Magnetic Materials and Coil Design

- Characteristics and performance of soft and hard magnetic materials Topic 1: •
- Curie temperature and alloying effects on magnetic properties Topic 2: •
- Eddy currents, skin effects, and energy losses in magnetic materials Topic 3: •
- DC and AC coil design principles and trade-offs Topic 4: •
- Techniques for optimizing wire resistivity and coil geometry Topic 5: •
- Temperature rise and thermal management in coil systems Topic 6: •
- Evaluating coil designs and identifying areas for improvement Reflection & Review: •

## Day 4: Advanced Electromechanical Components

- Transformer and inductor design methodologies Topic 1: •
- Core-type and shell-type transformers with leakage flux considerations Topic 2: •
- BH curve measurement techniques for core materials Topic 3: •
- Air-core inductors: Design principles and simulation insights Topic 4: •
- Biot-Savart law applications in magnetic force and field calculations Topic 5: •
- Torque and force calculations for permanent magnets and coils Topic 6: •
- Integration of advanced magnetic components into systems Reflection & Review: •

## Day 5: Integration, Sensors, and Emerging Technologies

- Rectification, shading, and performance enhancement in AC electromagnets Topic 1: •
- Slot motors and Thomson coil applications in industrial systems Topic 2: •
- Advanced magnetic field sensors: Hall, SQUID, and magnetoresistance technologies Topic 3: •
- Electromagnetic simulation techniques for system optimization Topic 4: •
- Case studies in electromechanical energy conversion systems Topic 5: •
- Capstone project: Design and analysis of a complete magnetic system Topic 6: •
- Presentation of projects and course wrap-up discussions Reflection & Review: •

## How This Course is Different:

The course offers a unique combination of foundational knowledge and advanced practical skills. Unlike other courses, this program emphasizes real-world applications of magnetic flux principles, electromagnetic simulations, and magnetic circuit design. With a strong focus on hands-on learning, participants will work on case studies and design exercises covering solenoid design, transformer optimization, and high-speed actuator implementation.



## فئات الدورات التدريبية



HR TRAINING & DEVELOPMENT

دورات إدارة و تطوير الموارد البشرية



دورات إدارة و تحليل البيانات ودورات علم البيانات



دورات إدارة الجودة وتطوير العمليات



الدورات التدريبية في مجال البيئة والاستدامة



دورات التسويق وإدارة علاقات العملاء وإدارة المبيعات



دورات التدريب القانوني والمشتريات والتعاقدات



دورات الاتصال الجماهيري و السياسات والعلاقات العامة



دورات النظم السبراني ودورات تقنية المعلومات



دورات الصيانة ودورات المجالات الهندسية المتنوعة



دورات الصحة والسلامة والأمن المهني



دورات السكرتارية و إدارة المكاتب



دورات الحوكمة وإدارة المخاطر والامتثال



**AGILE LEADERS**  
Training Center

## فئات الدورات التدريبية



دورات معتمدة من قبل هيئات دولية



دورات في مجالات القيادة والإدارة



دورات المهارات الشخصية وتطوير الذات



دورات المحاسبة و التمويل و دورات الإدارة  
المالية



دورات مكتب إدارة المشاريع وإدارة المشاريع  
الرشيقية

## مدن التدريب



أمستردام - هولندا



أكرا - غانا



أثينا - اليونان



أبوظبي - الإمارات العربية المتحدة



الدوحة - قطر



الدار البيضاء - المغرب



الجبيل - المملكة العربية السعودية



استنبول - تركيا



المنامة - مملكة البحرين



الكويت - الكويت



القاهرة - مصر



الرياض - المملكة العربية السعودية



بانكوك - تايلند



بالي - جمهورية إندونيسيا



بأكو - أذربيجان



باريس - فرنسا

## مدن التدريب



بورنو - البرتغال



برلين - ألمانيا



برشلونة - إسبانيا



براغ - جمهورية التشيك



جنيف - سويسرا



جاكرتا - جمهورية إندونيسيا



تيليسي - جورجيا



بوكيت - تايلاند



زنجبار - تنزانيا



روما - إيطاليا



دبي - الإمارات العربية المتحدة



جوهانسبرغ - جنوب إفريقيا



شهر الشيخ - مصر



سيول - كوريا الجنوبية



سنغافورة - سنغافورة



سان دييغو - الولايات المتحدة الأمريكية

## مدن التدريب



طوكيو - اليابان



طشقند - اوزبكستان



طرابزون - تركيا



شيكاغو - الولايات المتحدة  
الأمريكية



فيينا - النمسا



فرانكفورت - ألمانيا



عن بعد - منصة زووم



عمان - المملكة الأردنية الهاشمية



لشبونة - البرتغال



لانكاوي - ماليزيا



كيب تاون - جنوب إفريقيا



كوالالمبور - ماليزيا



مسقط - سلطنة عمان



مدريد - إسبانيا



ماربيا - إسبانيا



لندن - المملكة المتحدة

## مدن التدريب



نيروبي - كينيا



ميونخ - ألمانيا



ميلان - إيطاليا



مونترنو - سويسرا



نيس - فرنسا

# WHO WE ARE

Agile Leaders is a renowned training center with a team of experienced experts in vocational training and development. With 20 years of industry experience, we are committed to helping executives and managers replace traditional practices with more effective and agile approaches.

## OUR VISION

We aspire to be the top choice training provider for organizations seeking to embrace agile business practices. As we progress towards our vision, our focus becomes increasingly customer-centric and agile.

## OUR MISSION

We are dedicated to developing value-adding, customer-centric agile training courses that deliver a clear return on investment. Guided by our core agile values, we ensure our training is actionable and impactful.

## WHAT DO WE OFFER

At Agile Leaders, we offer agile, bite-sized training courses that provide a real-life return on investment. Our courses focus on enhancing knowledge, improving skills, and changing attitudes. We achieve this through engaging and interactive training techniques, including Q&As, live discussions, games, and puzzles.



**AGILE LEADERS**  
Training Center

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