



وزارة التعليم العالي
الأكاديمية المصرية للهندسة والتكنولوجيا المتقدمة
التابعة لوزارة الإنتاج الحربي
قسم الهندسة الميكانيكية

خطة البحث العلمى لقسم الهندسة الميكانيكية

محاور واتجاهات الخطة البحثية لقسم الهندسة الميكانيكية: 2021 - 2026

1- أهداف الخطة البحثية للقطاع الهندسى بالأكاديمية: 2021 - 2026

- ACA 1: Develop innovative ideas in mathematics, physics, and chemistry.
- ACA 2: Develop innovative ideas in science and nanotechnology.
- ACA 3: Evaluate design and technology using labs, tools and user's response.
- ACA 4: Initiate a comprehensive understanding of past and present practices in design and their effect on society as a background for future development.
- ACA 5: Develop innovative ideas in material, reaction, separation, and Chemical Process engineering.
- ACA 6: Develop innovative ideas in electronics, communication, and radar systems.
- ACA 7: Develop innovative ideas in signal, image, and compressive sensing.
- ACA 8: Interaction with the community and the surrounding environment through participation in solving their problems using technology.
- ACA 9: Use of modern technologies to deal with companies and institutions in the formulations of programs for professional intervention with contemporary problems in the industry.
- ACA10: Design of automatic control systems satisfying the needs of local industries.
- ACA11: Develop innovative ideas for Generating and consumption energy in various industries.
- ACA12: Develop innovative ideas in water treatment and reuse.
- ACA13: develop innovative techniques for solid waste management

2- محاور واتجاهات الخطة البحثية لقسم الهندسة الميكانيكية: 2021-2026

MEC Research Objectives 2021-2026

Major	Research Directions
Materials and Manufacturing	<p>MDM1 Nano-composite Materials</p> <p>MDM2 Improved Methods of Manufacturing Process</p> <p>MDM3 Solid-State Welding Technology (Friction Stir Welding)</p> <p>MDM4 CNC Applications</p>
Power Engineering & Renewable Energy	<p>PER1 Effect of Nano-fluids on the systems</p> <p>PER2 Heat Transfer applications</p> <p>PER3 Water desalination</p> <p>PER4 Solar and Wind Energy Applications</p>
Automotive Engineering	<p>AE1 Vehicle-to-Vehicle (V2V) Communication for Autonomous Driving</p> <p>AE2 Electric and Hybrid Vehicles Technology</p> <p>AE3 Energy Efficient Driving Strategies</p> <p>AE4 Powertrain Management Systems</p> <p>AE5 Driver-Assistance Systems</p> <p>AE6 Vehicle System Dynamics</p> <p>AE7 Maintenance and Diagnostic Systems</p>
Automatic Control and Artificial Intelligence	<p>ACI1 Modeling and System Identification</p> <p>ACI2 Nonlinear Control Systems</p> <p>ACI3 Model Predictive Control</p> <p>ACI4 Adaptive Control</p> <p>ACI5 Robust and Optimal Control</p> <p>ACI6 Artificial Intelligence for Mechatronic Systems</p> <p>ACI7 Embedded Systems for Mechatronic Applications</p> <p>ACI8 Multi-Agent systems</p>
Robotics	<p>ROB1 Mobile Robots</p> <p>ROB2 Industrial Robots</p> <p>ROB3 Object Detection and Control of Robotic Manipulators Based on Image Processing</p>
Biomechatronic	<p>BM1 Diagnostics and Support Systems</p> <p>BM2 Prosthetic Limbs</p> <p>BM3 Rehabilitation Robotics</p> <p>BM4 Mobility Assistance Systems</p> <p>BM5 Assistive Robotic Systems</p> <p>BM6 Bioinspired Robotics</p>

	ACA1	ACA2	ACA3	ACA4	ACA5	ACA6	ACA7	ACA8	ACA9	ACA10	ACA11	ACA12	ACA13
MDM1					X			X					
MDM2					X			X					
MDM3					X			X					
MDM4					X			X					
PER1								X					
PER2								X					
PER3								X					
PER4								X					
RA1							X	X		X			
RA2							X	X		X			
RA3							X	X		X			
RA4							X	X		x			
AEV1							X	X		X			
AEV2							X	X		X			
AEV3							X	X		X			
AEV4							X	X		x			
AEV5							x	x		x			
ACI1							X	X		X			
ACI2							X	X		X			
ACI3							X	X		X			
ACI4							X	X		X			
ACI5							X	X		X			