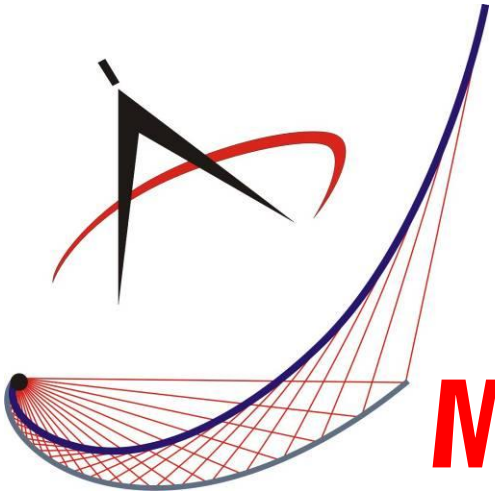

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Special Issue (Vol. XVII, No. 3 / 2025)

Advances in Manufacturing Technologies, Processes, Systems and Materials

The manufacturing industry is constantly evolving, forcing manufacturers to react quickly to industry changes and make a firm commitment to efficiency in every aspect of the business to remain competitive in the marketplace. Advances in manufacturing can be achieved through significant upfront investments, which will lead to long-term savings through optimized use of resources and reduced error rates.

Precision technologies and automated systems ensure consistent, high-quality production, enabling the creation of complex patterns and achieving tight tolerances. Advanced manufacturing refers to the use of innovative technologies to create new products, refine existing products, and perform manufacturing activities that will improve quality and the manufacturing process itself.

The topics in advanced manufacturing technologies are robust and include Artificial Intelligence, Machine Learning, Digital Twin, Robotics and Automation, Additive Manufacturing, Nanotechnology, Advanced Materials, Networking and Connectivity, Internet of Things (IoT), Industrial Internet of Things (IIoT), Laser Machining, and Augmented Reality (AR). These technologies, processes, and systems are used to manufacture and modify materials in ways that improve their performance. Each of these advanced manufacturing processes plays a valuable role in helping manufacturers work safer and efficiently.

Increasing output while maximizing value, quality, market responsiveness, and flexibility is the goal of advanced manufacturing. Reducing time to market, material inventory, content, and unit quantities are further goals of advanced manufacturing.

Although some sectors are presently at the forefront of the testing and application of advanced manufacturing technologies, advanced manufacturing systems are and will remain beneficial to nearly every industry in the future. Enhanced product quality, shorter production schedules, and increased productivity, efficiency, and quality are just a few of the benefits that advanced manufacturing processes offer, regardless of the industry.

This Special Issue, *Advances in Manufacturing Technologies, Processes, Systems and Materials*, is mainly focused on Micro and Nanotechnologies, Rapid Prototyping Technologies, High Speed Manufacturing Processes, Manufacturing and Automation, Flexible Manufacturing, Cold Forming Technologies, CAD/CAM/CAE/CAX Integrated Systems, Simulation and Optimization, Concurrent Engineering, Non-conventional Technologies, Virtual Manufacturing, Welding, technologies, processes, systems and materials used which could include the topics presented above.

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