

### **Report on FDP on Advances in Manufacturing**

The Department of Mechanical Engineering at Ajay Kumar Garg Engineering College successfully conducted a five-day ICT-based Faculty Development Programme on “**Advances in Manufacturing**” from 17<sup>th</sup> November to 21<sup>st</sup> November 2025, in collaboration with NITTTR, Chandigarh. This achievement aimed at providing both academic and research growth among faculty participants through practical case studies and problems on Advanced Machining approaches and Siemens NX software, which is an advanced CAD/CAM/CAE software suite used across various engineering fields for design, simulation, and manufacturing. A total of 30 faculty participants from renowned engineering institutes/universities registered and actively participated, in which 16 faculty members joined through our AKGEC Remote Center. The active engagement of participants from three remote centers and contributions from various speakers from institutes of national eminence, including Dr. Pallab Biswas (HoD ME), and local coordinators Dr. Suman Gothwal and Dr. H.S. Chaurasiya, significantly contributed to the program's success.

| <b>S. No.</b> | <b>Title and theme of the FDP</b> | <b>Speakers with designation and organization along with little details of topics covered by them</b>                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Duration and dates of FDP</b>          | <b>Participants in numbers and institutions of participants</b>                                                       |
|---------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| 1             | Advances in Manufacturing         | <p>Hirdey Pal Singh, Associate Professor</p> <p>Topics covered:</p> <p><b>Advantages of Siemens NX</b></p> <p><b>1. Integrated Environment</b></p> <p>Combines CAD, CAM, and CAE in one platform, reducing data transfer issues and improving collaboration.</p> <p><b>2. High Precision and Reliability</b></p> <p>Delivers accurate modeling and analysis for complex mechanical parts.</p> <p><b>3. Parametric and Direct Modeling</b></p> <p>Offers flexible modeling approaches for fast design changes and iterations.</p> | 5 Days,<br>17/11/2025<br>To<br>21/11/2025 | Total<br>Participants: 30,<br>out of which 16<br>Participants<br>joined from<br>AKGEC,<br>Ghaziabad,<br>remote centre |

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|   |                           | <p><b>4. Automation and Productivity Tools</b></p> <p>Supports knowledge-based engineering (KBE), templates, and design reuse to save time.</p> <p><b>5. Advanced Simulation Capabilities</b></p> <p>Built-in tools for motion, thermal, and flow simulations, eliminating the need for separate software.</p> <p><b>6. Scalability and PLM Integration</b></p> <p>Integrates seamlessly with Teamcenter, allowing enterprise-level collaboration and version control.</p> <p><b>7. Supports Modern Manufacturing</b></p> <p>Enables digital twin and Industry 4.0 workflows—linking design, simulation, and production data.</p> <p><b>8. Excellent Visualization and Rendering</b></p> <p>Offers realistic visualization, which helps in presentations and design reviews.</p> |                                                     |                                                                         |
| 2 | Advances in Manufacturing | <p>Sunil Dutt Jassal, Associate Professor</p> <p>Topics Covered:</p> <p>1. <b>Product Design (CAD)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p>5 Days,<br/>17/11/2025<br/>To<br/>21/11/2025</p> | <p>Total Participants: 30, out of which 16 Participants joined from</p> |

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|  |  | <p>Creation of 2D and 3D models of mechanical parts and assemblies.</p> <p>Surface modeling for complex geometries (e.g., automotive or aerospace components).</p> <p><b>2. Engineering Analysis (CAE)</b></p> <p>Structural, thermal, and motion analysis of parts and assemblies.</p> <p>Finite Element Analysis (FEA) integration for stress and strain evaluation.</p> <p>Simulation of real-world conditions to optimize design before manufacturing.</p> <p><b>3. Manufacturing (CAM)</b></p> <p>CNC programming for milling, turning, drilling, and other operations.</p> <p>Toolpath generation and machining simulation.</p> <p>Integration of CAD and CAM data for smooth design-to-manufacturing transition.</p> <p><b>4. Product Lifecycle Management (PLM)</b></p> <p>Integrates with Teamcenter for managing design data, revisions, and workflows.</p> <p><b>5. Additive Manufacturing (3D Printing)</b></p> <p>Design optimization of parts for 3D printing.</p> |  | <p>AKGEC,<br/>Ghaziabad,<br/>remote centre</p> |
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|  |  | <p>Topology optimization to reduce material use and weight.</p> <p><b>6. Aerospace, Automotive, and Industrial Applications</b></p> <p>Used by companies like Boeing, BMW, and Rolls-Royce for advanced mechanical systems.</p> |  |  |
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