Tooling & Die Design in Manufacturing Training Course

Professional Development Training Course Outline

Category	Manufacturing	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Tooling & Die Design in Manufacturing Training Course is designed to equip learners with advanced competencies in tool design, die engineering, CAD/CAM integration, precision manufacturing, sheet metal forming, injection molding design, and CNC tooling systems. With the rise of Industry 4.0, smart manufacturing, and digital twin technologies, the demand for skilled tooling and die designers has significantly increased across automotive, aerospace, heavy engineering, and consumer product industries.

This course provides a comprehensive blend of theoretical knowledge and hands-on practice in press tool design, progressive dies, stamping die systems, jig and fixture design, mold design optimization, tolerance analysis, and material selection techniques. Participants will gain exposure to cutting-edge tools such as SolidWorks, AutoCAD, CATIA, Siemens NX, and simulation-based die validation systems, enabling them to meet global manufacturing standards. The program is tailored to enhance employability, innovation capability, and real-world problem-solving in high-precision manufacturing environments.

Programme Curriculum

Tooling & Die Design in Manufacturing Training Course

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Course Duration

5 days

Course Objectives

1. Master advanced tooling and die design principles for manufacturing applications
2. Develop expertise in CAD/CAM-based die design and 3D modeling workflows
3. Understand sheet metal forming and stamping process optimization
4. Learn progressive die design for high-volume production systems
5. Apply DFM (Design for Manufacturability) and DFA principles
6. Perform tolerance stack-up analysis and geometric dimensioning (GD&T)
7. Gain skills in injection molding and plastic mold design engineering
8. Optimize tool life cycle management and maintenance strategies
9. Use CAE simulation tools for die stress and flow analysis
10. Improve tool material selection and heat treatment processes
11. Develop jigs, fixtures, and precision workholding systems
12. Understand lean manufacturing and Industry 4.0 integration in tooling
13. Build job-ready skills for automotive, aerospace, and precision engineering industries

Target Audience

1. Mechanical Engineering Students
2. Diploma Holders in Tool & Die Making
3. Manufacturing Engineers
4. Design Engineers (CAD/CAM Professionals)
5. Automotive Industry Technicians
6. Production Supervisors and Managers
7. CNC Machine Operators and Programmers
8. Fresh Graduates seeking **core engineering careers in manufacturing**

Course Modules

Module 1: Fundamentals of Tooling & Die Design

- Introduction to tooling systems and die types
- Role of tooling in mass production industries
- Basic engineering drawing standards
- Overview of press tools and stamping operations
- Fundamentals of material behavior in tooling
- **Case Study:** Automotive sheet metal body panel die design overview

Module 2: CAD for Tool & Die Design

- AutoCAD and SolidWorks for tooling design

- 2D drafting to 3D modeling conversion
- Assembly design of die components
- Parametric modeling techniques
- Design validation methods
- **Case Study:** 3D modeling of progressive die using SolidWorks

Module 3: Press Tool Design & Development

- Types of press tools (blanking, piercing, bending)
- Die set construction and components
- Strip layout design techniques
- Punch and die clearance calculations
- Tool alignment and guiding systems
- **Case Study:** High-speed blanking die for electrical components

Module 4: Progressive Die Design Systems

- Multi-stage progressive die operations
- Feed mechanisms and strip layout optimization
- Pilot and carrier strip design
- Station sequencing and tooling synchronization
- Error prevention in progressive stamping
- **Case Study:** Progressive die for mobile phone metal frames

Module 5: Injection Molding & Plastic Die Design

- Mold cavity and core design principles
- Runner and gating systems
- Cooling channel optimization
- Ejection systems and mold release techniques
- Shrinkage and material flow considerations
  Case Study: Plastic automotive dashboard mold design

Module 6: Jig & Fixture Design Engineering

- Types of jigs and fixtures
- Workholding principles in machining
- Locating and clamping methods
- Modular fixture systems
- Automation integration in fixtures
- **Case Study:** CNC machining fixture for aerospace bracket production

Module 7: Simulation & Analysis in Tooling

- CAE tools for stress and deformation analysis
- Metal flow simulation in die forming
- Mold flow analysis for plastics
- Thermal analysis of tooling systems
- Optimization through digital simulation
- **Case Study:** Die failure prediction using finite element analysis (FEA)

Module 8: Manufacturing Integration & Industry 4.0

- Smart tooling systems and IoT integration
- Digital twin technology in die design
- Predictive maintenance for tooling systems
- Lean manufacturing applications
- Automation in modern press shops
- **Case Study:** Smart press shop implementation in automotive manufacturing plant

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
21 Sep 2026	25 Sep 2026	Online	$1,000
21 Sep 2026	25 Sep 2026	Physical	$1,500
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0

Ready to enroll or request a customized program? Book online or contact us:

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