Amatrol’s eLearning curriculum features a highly-interactive, multimedia format that includes stunning 3D graphics and videos, voiceovers of all text, and quizzes and exercises designed to appeal to all learning styles. Each Materials Learning System has its own in-depth curriculum designed to teach hands-on skills with real-world equipment. In addition, Amatrol also offers eLearning courses focused on ferrous metals, non-ferrous metals, heat treatment, plastics, composites, and ceramics.

### Learning Systems

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<th>Hands-On Trainer</th>
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#### DESIGN OF STRUCTURES
- **Design of Structures 1 (94-DOS1)**
  - Civil Engineering, Statics & Data Acquisition, Moments & Bending Stress, Bridge Design & Construction
- **Design of Structures 2 (94-DOS2)**
  - Beam Deflection, Column Buckling, Concrete, Building Design, Construction
- **Design of Structures 3 (94-DOS3)**
  - Surveying Fundamentals & Applications, Mapping, Global Positioning Systems (GPS)

#### PLASTICS
- **Plastics Technology (94-MP3T)**
  - Injection Molding Operations, Chemistry & Properties of Plastics, Blow Molding & Extrusion Operations
- **Mold Design (94-DFM3)**
  - Basic & Advanced Injection Mold Design, Plastics Part Design & Material Selection, Basic Blow Molding Design

#### MATERIALS ENGINEERING
- **Materials Engineering 1 (94-MT1)**

#### PRINCIPLES OF MATERIALS
- **Ferrous Metals (MXML201)**
  - Properties of Ferrous Metals, Iron Ore, Pig Iron, Steel Production, Strength, Ductility, Machinability, Hardenability, Corrosion Resistance, Alloys, Stainless Steel, Carbon Steel
- **Non-Ferrous Metals (MXML202)**
  - Properties of Non-Ferrous Metals, Copper, Aluminum, Alloys, Casting, Tempering, Nomenclature & Specifications
- **Heat Treatment (MXML203)**
  - Principles of Heat Treatment, Hardening, Quenching, Annealing, Tempering, Normalizing, Stress Relieving
- **Plastics (MXML204)**
  - Principles of Plastics, Thermoplastics, Thermosets, Polymerization, Ethylene, Polypropylene, Injection & Blow Molding, Estimation, Environmental Impact
- **Composites (MXML205)**
  - Principles of Composites, Constituent Materials, Fiber-Reinforced Materials, Hand Lay-up, Spray-up, Filament Winding, Resin Transfer Molding, Curing, Environmental Impact
- **Ceramics (MXML206)**
  - Principles of Ceramics, Glass, Clay, Refractories, Melting, Casting, Firing, Forming, Drilling, Fracturing, Extrusion, Injection Molding, Drain & Solid Casting

### Curricula Topics Include:
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Properties of Materials eLearning Courses

- Comprehensive overview of the broad range of materials used in modern industry, including ferrous metals, non-ferrous metals, plastics, composites & ceramics
- Detailed focus on the physical, mechanical, chemical, thermal, optical, electrical & environmental properties of materials
- In-depth review of materials classifications, specifications & nomenclature
- Advanced learning topics include steelmaking processes, alloys, heat treatment, environmental concerns & materials manufacturing processes

Structural Design & Engineering

- Introduction to the design, engineering, construction & analysis of various structures, including bridges & buildings
- Project-oriented training that allows learners to build scale models & test their work with strain gauges & a data acquisition system
- Hands-on surveying training with real-world equipment, including GPS receiver

Plastics Molding Basics

- In-depth instruction on polymers & properties of plastics
- Hands-on practice and troubleshooting with injection, blow & extrusion molding
- Design & create injection & blow molds using CAD/CAM software & a CNC machine

Industrial-Grade Materials Analysis

- Industrial-quality components provide learners with real-world experience
- Analysis & evaluation of various materials for particular product designs & applications, including aluminum, copper & steel
- Advanced materials testing: tensile, compression, hardness, torsion, fatigue, toughness & shear

Each of These Systems Features Real-World, Heavy-Duty Components and Extensive eLearning Curriculum