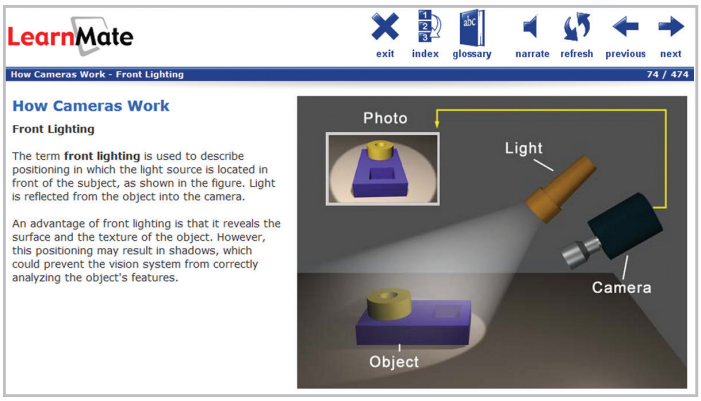
Vision Technology

Vision Technology courses introduce students to technology that connects cameras and computers to provide the image interpretation and visual feedback needed for part inspection, robotic guidance and industrial automation.



Course Information

Type	Virtual, Lab
Units of measurement	Imperial; Metric
Languages	English
Hours of instruction per course	15

Machine Vision and Image Processing

In Machine Vision and Image Processing course students acquire skills in the complex functions required for image processing, image analysis and object identification. They gain experience that will enable them to combine the vision system with a robotic system for vision-guided robotic applications, or to integrate it within a CIM system for part inspection and quality control.

Course Outline

- Machine Vision and Quality Control
- Binary and Hexadecimal, Bits & Bytes
- Camera
- Image Digitization
- Grayscale, Binary Images
- Color
- RGB, CMYK and HSL
- Introduction to Blobs
- Blob Analysis
- Image Quality and Interference Problems
- Noise
- Neighborhood & Point-to-Point Operations
- Morphological and Geometric Operation
- Arithmetic Operations
- Quality Control

Exploring Machine Vision and Quality Control

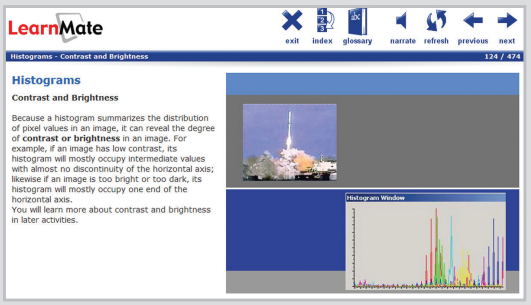
Exploring Machine Vision and Quality Control course introduces students to the world of machine vision and its numerous applications in industry and in daily life. Students complete a final project using some of the machine vision operations they have explored.

Course Outline

- Image Calibration
- Pattern Matching and Searches - Part 1
- Pattern Matching and Searches - Part 2
- Finding & Measuring Edges & Stripes
- Digital Images: File Types, Compression, Graphic Cards & Scanners
- Introduction to Remote Sensing
- Remote Sensing and Image Processing
- Machine Vision in the Medical Sector
- Analog and Digital Camcorders
- Machine Vision and Robot Guidance
- Introduction to Using Programming Languages

Vision Technology courses include LearnMate®, Intelitek's innovative e-learning platform. Self-paced interactive LearnMate content may be deployed stand-alone or through the robust learning management system (LMS). The LearnMate e-learning suite provides everything needed for the ultimate blended learning experience:

- SCORM-compliant interactive content
- Anytime, anywhere accessibility
- Student and class management
- Grade tracking
- Skill/competency reporting mapped to national academic skill standards



Machine Vision and Quality Control Lab Bundle

The Machine Vision and Quality control course includes ViewFlex interactive vision software that is based on the Inspector image processing engine. The system also includes a USB digital color camera that provides both still and video images. ViewFlex can be used for stand-alone vision operations, or integrated in Intelitek's CIMflex systems for vision-based quality control application, or coupled with SCORBOT robots for vision-guided robotic tasks and QC processes.

Course Outline

- Camera and Lighting
- Image Digitization
- Working with Images
- Image Enhancement
- Using Filters
- Object Analysis
- Pattern Matching
- Blob Analysis
- Quality Control - Flaw Detection
- Quality Control - Part Counting
- Quality Control - Measurement and Gauging
- Quality Control - Position Verification
- Executing a Machine Vision Operation

Lab Hardware Includes

Qty.	Description
1	Viewflex - Machine Vision (Stand 1000mm)
1	USB Camera w/Mount
1	Camera Stand
1	SHCS, M6 x 50 mm, Blk
8	Hex Nut, M8, Blk
1	Hex Nut, M6 5mm H, Zinc
1	Flat Washer, M8, Zinc
4	PVC Cylinder - Grey, 46 mm x 28 mm
1	PVC Cylinder - Grey, 35 mm x 28 mm
1	PVC Cylinder - Grey, 26 mm x 28 mm

ViewFlex software offers an extensive set of optimized functions for image processing and enhancement, blob analysis, gauging and measurement, and pattern matching. The system supports applications such as precision measurement, flaw detection and assembly inspection to enable compliance with exacting quality requirements.

ViewFlex enables students to design and develop their own vision applications using the software's Visual Basic for Applications (VBA) compatible scripting environment. The software can also interact with other Windows applications using OLE/Automation.

Ordering Information

Curriculum

Machine Vision & Image Processing LearnMate course, Virtual	77-3027-0000
Exploring Machine Vision and Quality Control LearnMate course, Virtual	77-3028-0000

Bundles

Machine Vision and Quality Control includes curriculum, hardware and software	

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